POSTMOLDS: IDENTIFICATION AND INTERPRETATION FROM THE LONG ISLAND DATA BASE

BY

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"Because of that, we must have a kind of integrity most fields don't need. I need your data, and you need mine, and we have to be able to trust each other on some basic level. There can't be any back stabbing or working in total isolation, or any of this sitting on a rock in the forest interpreting culture in ways no colleague can duplicate" (Flannery 1982:277).

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS i

FIGURES AND TABLES iv

CHAPTER I: INTRODUCTION 1

THE MODELS. 3

CHAPTER II: AN OVERVIEW 10

SYSTEMATIC RESEARCH 11

A SUMMARY OF THE HISTORY OF LONG ISLAND ARCHAEOLOGY 12

DATA COLLECTION 17

TYPES OF ARCHITECTURAL REMAINS. 18

THE ETHNOGRAPHIC DATA 20

OTHER CONSIDERATIONS. 24

CHAPTER III: THE DISCOVERY OF POSTMOLDS ON LONG ISLAND TO DATE: THE DATA BASE 27

THE MUSKEETA COVE SITE. 31

THE AQUEDUCT SITE 33

THE STRONGS NECK SITE 35

BULL CALF LANDING 36

SMITH SITE. 37

TWIN PONDS SITE 39

SHINNECOCK SITE 40

CRYSTAL BROOK SITE 42
ENGLEBRIGHT SITE 43
PIPESTAVE HOLLOW 44
SUNGIC MIDDEN SITE 45
SUMMARY 46

CHAPTER IV: CURRENT INTERPRETATIONS AND THEORIES 48
THE MYTH OF THE HOMOGENEOUS SITE 53
THE MYTH THAT THE SITE ENDS AT THE SHELL MIDDEN'S EDGE 55
THE POSSIBILITY OF LOCATION AND IDENTIFICATION OF ARCHITECTURAL REMAINS 58

CHAPTER V: THEORY BUILDING: TEST CASES AND EXAMPLES 61
TICK HOLLOW 64
MOTTS POINT 67
OAKLAND LAKE 68
LIVINGSTON POND 68
WADING RIVER AND SHOREHAM SITES 70
CEDAR CREEK 78
SUMMARY 80

CHAPTER VI: CONCLUSIONS 82
SEASONALITY AND SHELTERS 84
STRATEGY 86
POST DEPOSITIONAL ISSUES 89
SUMMARY 90

BIBLIOGRAPHY 93

CHAPTER I

INTRODUCTION

A long standing and problematic issue in Long Island archaeology has been the paucity of architectural remains, other than hearths, excavated to date. Postmolds are rare, usually inconclusive, and may not lend to interpretation because of the apparent lack of patterns. The very discovery and identification of a postmold is exciting and of sufficient importance to warrant publication (for an example of the latter see Gwynne 1984).

In addition, since such important features are absent from most of the sites excavated, other evidence has had to suffice for supporting theories on settlement and subsistence. Without postmolds, or the discolored remains of earth and decayed wood fibers that indicate where poles were once positioned, the evidence is usually derived from other features, artifacts, and food remains when identifying potential residential bases. While the presence of postmolds is not essential for identifying a residential base, such would add considerable strength to the interpretation.

This paucity of architectural remains has had not only a limiting effect on the development of settlement/subsistence studies but also has provided some basis for alternative theory building regarding such patterns (see Ceci 1977 and Silver 1980) for Long Island. This paradigm debate is partially based on this uncomfortable absence of these remains, which is used as partial support for sedentary communities (along with other issues which will not be discussed in this paper). As already noted:

> "On the other hand, the evidence for sedentary communities on Long Island is not overwhelming. Ceci (1980, 1982) notes that the vast majority of prehistoric sites are small, shallow and contain little evidence for house structures" (Lightfoot et al. 1987: 4).

As discussed by Lightfoot and associates (1987: 8), the degrees to which local populations adopted sedentary life or established residential bases "suggest that we lack a clear understanding of many basic issues concerning prehistoric subsistence-settlement systems". This in part is due to (a) the field methodology and strategy implemented and (b) the nature of the archaeological record (Lightfoot et al. 1987: 8).

This research paper will concentrate upon one issue: the apparent paucity of architectural features. The points targeted do have a wider application, as the nature of biased and skewed data collection are examined. In Chapter II, an overview of the history of Long Island archaeology and ethnohistory is provided. Chapter III is a review of what has been accomplished to date, while Chapter IV will consider why only a limited amount of this type of data has been found. Chapter V will focus on research strategies that could be applied to increase the probability of locating such remains. Lastly Chapter VI will provide an overview and summary of the problem. One of the priorities is to hopefully establish a research strategy which may be useful for locating postmolds in the future. At the very least, prior errors will be targeted, so that past mistakes are not repeated.

The primary thrust of these discussions is to aid in the study of architectural features which can with due diligence be found, identified, and interpreted. This type of examination should lead ultimately to healthy and practical research. The intent is not to be harsh or overly critical of prior archaeological undertakings but rather to evaluate the past, analyze objectively, and provide a sounder footing for the future.

Nor is this report intended in any way to claim a superior position gained through hindsight. To be overly critical of work undertaken in good faith several years ago, with the standard techniques of that time, is unfair to the investigators. However, a good hard look at previous methodology is healthy and necessary in order to target certain issues which have been either overlooked or poorly realized. Such positive criticism often does foster new directions in research and theory building.

THE MODELS

A perusal of the literature can provide a vague notion that Long Island archaeology does not enjoy the same level of interpretative sophistication as other areas of the Northeast. This in part results from problems associated with poor preservation throughout this area and the further complication of the destructive effects of construction and other contemporary activities. If these were not enough, there are funding problems and a general lack of available manpower. Most sites are excavated by solitary investigators who have limited resources in labor, time, and money with their activities restricted to a contractually or logistically circumscribed area.

For example, Long Island sites have little to no formal seasonality analysis, few carbon 14 dates, and very little work has been done on the identification of settlement system components (except for Salwen 1968; Lightfoot et al. 1985, 1987; and Gwynne 1979, 1982, 1984). Much of the earlier work remains unchallenged and unelaborated upon. While all contributions are worthwhile and certainly necessary, very few to date (with the exception of Lightfoot et al. 1985; Lightfoot et al. 1987; and Gwynne 1984) have attempted to locate and identify architectural remains. In some cases, other archaeologists are still waiting for better guidelines and reports of relevant discoveries by others before investing time and funds.

Often evidence appears to be negative, indicating that there are no architectural remains that can be associated with a specific site or component. However, the sampling may be biased or inadequate. In the cases of contract archaeology, where only a specific portion of a site or area is explored, the possibility of bias is very evident, providing an inaccurate assessment of the site's features.

Also of concern is difficulty in actually linking the postmold(s) to a specific cultural context. Postmolds are often difficult to date, with dating often depending on artifacts found nearby. All too frequently there are no datable samples from the postmolds. In general, the dating of such features has been fraught with uncertainties.

Thus, not unexpectedly, pessimism pervades the local archaeological community in their perceptions of the possibilities of locating architectural remains (see for example Kaeser 1974). More than once the impermanent flimsy shelter hypothesis has been invoked to explain the lack of the architectural remains at a site (see for example Wyatt 1977). When occasionally they have been found, the apparent lack of patterning in the surviving elements was also discouraging.

Frequently, the models employed for field research derive from other geographical areas. The literature from other portions of the Northeast is often searched for examples and models of what has been found elsewhere, under what conditions and with what associated material culture.

In particular, upper New York State is often a source of comparative data with the assumption being that Long Island site types are similar to or an exact duplicate of the sites found in the interior of New York State. These premises may very well be true in certain instances, but are not true in all instances. While the similarities have certainly been emphasized and even forced, significant differences have never been properly identified and emphasized. Such differences derive, at least in part, from the fact that the Long Island sites are coastal and have environments that differ markedly from those at the interior, as well as having a very different set of resources.

Expectations were formed by the examples set in the archaeology of interior sites. This was strengthened when William Ritchie, then the State Archaeologist, excavated both in the interior and coastal zones.

One of the most famous sites on Long Island, the Orient site, was excavated by Ritchie (1980) whose subsequent publications intrigued both professionals and layman. His influence and the engendered publicity were a spur to further research in the coastal zones. Ritchie's influence further focused attention on the many detailed excavations from interior New York State, and the descriptions of postmolds had a profound effect on the Long Island archaeological community.

Ritchie's "definitive volume, The Archaeology of New York State" (Brennan 1964: 10) described postmolds as numerous, with discernible patterning and, more importantly, stated that features were relatively easy to locate (see Ritchie 1980). Such meaty descriptions as the following were quite influential:

> "As in the first excavation, a large and confusing number of postmolds was uncovered, resoluble in part into four reasonably distinct and equal number of indefinite house patterns, pertaining to circular or oval structures, twelve to fourteen feet across. Near-central hearths in shallow basin-shaped depressions were found in all, while in some an inner ring of postmolds showed, probably, that a narrow bench had been extended around the interior. . . ." (Ritchie 1980: 287).

As the professional and avocational fieldworkers were diligently working on sites which were rapidly being destroyed by post-World War II construction, there was only one system of classification available and one detailed site primer for interpretation: Ritchie. Through time, a system of comparison, measurement and procedure took root, based on Ritchie's (1980) (see also Ritchie and Funk 1973) various notable works. All models and typologies were taken from sites in the interior of New York.

In upper New York State, sites were reported which had abundant and well defined examples of postmolds along with accompanying features. These supported the theory of sedentary populations. In addition, structural changes could also be ascertained (Ritchie 1980: 285) as well as repairs (Ritchie 1980: 319). It was not uncommon to extract a great deal of information from these features.

In the interior, Ritchie also found that postmolds had tapered to rounded bases (Ritchie and Funk 1973: 145), and these features ranged from three to eleven inches across. Hearths, located typically in the middle of a circle of postmolds were common. In the larger shelters, multiple fireplaces were found (Ritchie 1980: 309). Apparently postmolds were relatively easy to identify in most soils in the interior of New York State.

Houses in the interior also appear to be located in groups and were of considerable size. At the Maxon-Derby site a 20' x 23' oblong house pattern was found (Ritchie 1980: 217, 282). Occasionally evidence was so refined that the method of installation (set in a hole rather than twisted) could be ascertained (Ritchie 1980: 309).

It was these types of sites, literally overflowing with features and artifacts, that were used as a standard of comparison. But instead of the strong, well defined postmolds which could range from five to 11 inches in circumferences and as much as 25" in depth (typical of upper New York State), Long Island only had small easily disintegrating stains which typically disappeared when cross-sectioned.

Even outside of New York, the surrounding States also have reported architectural remains. In New Jersey (Kraft 1970) numerous examples (18"-60" in length and to 20" in width) were found with associated features.

With these types of contributions, Long Island appeared deficient. The prehistoric coastal adaptation strategies did not appear to duplicate the types of remains found elsewhere. Unfortunately, Long Island appeared and still appears to be an enigma.

> "Although Long Island falls within the general cultural purview of the northeastern Woodlands, it can by no means be viewed as environmentally typical of the northeast as a prehistoric culture area (see for instance Funk 1977: 21, who specifically omits coastal New York in his definition of the Northeast). Indeed Long Island is atypical for the coastal Northeast as well, as a review of climatic and biotic differences demonstrates. . . . The task, therefore, of explaining the relationship of the prehistoric archaeology of Mount Sinai Harbor to that of the rest of the northeast is not so much a matter of placing the harbor area's prehistoric record within the larger cultural sequence as it is of isolating it from that sequence. It is only in this way that the environmental, and hence cultural uniqueness of Long Island's North Shore can fully be appreciated in comparison with the rest of the prehistoric northeast" (Gwynne 1982: 37).

It is relatively recently that it was realized that coastal New York would not and could not fit neatly into the models generated from the interior.

Unfortunately, Long Island's lack of conformity combined with the relative paucity of cultural remains cast a shadow on Long Island. It was only through the interest of such early pioneers, Ralph Solecki and Bert Salwen, that the archaeology of Long Island in the 1960's was as productive as it was. It was not until the presentation of an alternative theory (see Ceci 1977) that new growth, direction and information was generated from new research projects (see for example Gwynne 1984, 1982, 1979; and Lightfoot et al. 1987; and Lightfoot 1985).

Until appropriate research is conducted in the coastal zones, comparisons to the interior or the use of interior models may be premature. Alignment of expectations to the interior discoveries may ultimately bias the research and the subsequent results. Even Ritchie recognized that the remains on the coast may be radically different from the interior (Ritchie and Funk 1973). Comparison would be productive only after the evidence has been recovered and analyzed, rather than before.

CHAPTER II

AN OVERVIEW

Most archaeologists recognize that soil conditions on Long Island do not appear to be conducive to the preservation of postmolds. Many a Long Island archaeologist has had the "frustrating experience of attempting to cross-section what appears to be a postmold, only to have the suggestive dark stain diffuse and disintegrate in the sandy soil" (Gwynne 1984: 1). But as Table 2 suggests, postmolds can be identified.

It appears to be a difficult task to identify postmolds. This may be partially due to preconceived notions as to how the remains should appear and respond to the trowel. While these preconceived notions are necessary for the identification and excavation of features and artifacts, the very same concepts can also hinder an identification process. This is particularly exemplified when standards are set such as the following:

> "Postmolds, dark circles in the surface, from an inch in diameter up to, very rarely, eight inches or more, are excavated when they are first encountered in section to prove they are postmolds and not the channels of decayed roots. The stakes and posts driven or set by Amerinds were sharpened at the end, not necessarily for driving but because that was the way the tree was cut. This sharpened point should show in the profile of the postmold. As soon as a postmold is authenticated, the search begins at the level where its orifice was discovered for the next one, and the next" (Brennan 1973: 126).

There is no basic formula for the postmold. It may not be the small round stain which tapers nicely to a point. The remains represented will be a function of method of placement, the raw material, the design of the pole and the implements used to fashion it. For example, there are at least three methods of placement: one is to drive the stake firmly into the ground by using an instrument, another is by twisting the pole in and lastly to excavate a hole, put the pole in, backfill and secure.

The soil conditions and all other factors might not leave a tidy little impression but instead an odd or unexpected shape. Therefore, possibilities should not be discarded. If probable postmolds were recorded, along with all the attributes and circumstances of recovery, common characteristics may be extracted, leading to identification. Using a more expanded interpretation of how postmold remains may be represented in the soil, there may be more frequent identification. Supportive data could also be obtained by chemical and other types of analysis (see Dincauze 1976 and the State Service for Archaeological Investigations 1966).

SYSTEMATIC RESEARCH

In addition to anticipated physical characteristics and models based on different geographic locales, there is also the issue of systematic archaeological research. Many theories have been formulated based simply on personal opinions or gut level reactions. This can be exemplified by Johannemann's (1986) opinion that postmolds will never be found since they were only saplings which were dug into the shell midden in order to support flimsy shelters, which have not left a trace.

Such an approach does not foster appropriate research designs. Although there has been some systematic research (Johannemann 1986) in investigation outside the midden area, these attempts were generally unstructured and ad hoc. From such brief forays the theory was formulated that these remains would probably never be found. This gut level approach is more emotional than systematic and does not provide productive research.

There are however other archaeologists for example (Gwynne 1979, 1982, 1984) who have actively searched for architectural evidence and have had their labors rewarded. The difference in approach appears to be recognizing that the discovery of postmolds remains as a research priority along with continued testing and examination of field strategy. "The postmolds discovered at Crystal Brook were instrumental in my decision to continue the search for evidence of season of occupation" (Gwynne 1982: 524). What is really needed is continued systematic research and theory building. Apparently, what is sought after can frequently be found.

A SUMMARY OF THE HISTORY OF LONG ISLAND ARCHAEOLOGY

> "The history of prehistoric archaeology on Long Island
> is a melancholy even a tragic one" (Brennan 1978: xi).

Local farmers were Long Island's earliest archaeologists. At the Wolver Hollow site (Chomko and Wyatt 1970) at Matinecock, Nassau County, several prehistoric artifacts were found amongst 19th Century foundation remains. It is hypothesized that the occupants were collectors of such "relics". Additional examples can be taken from the historic literature. In Daniel Tredwell's personal journal he discussed an apparently typical activity in 1839 as "searching and digging for Indian curiosities in the old shell heap in the swamp lot" (Tredwell 1912: 50).

This type of collecting behavior was typical and common for not only that time period but for the 20th Century as well. Long Island archaeology has been plagued by local collectors such as farmers and hobbyists. The damage done by hobbyists or "pothunters" has been extensive, leaving a legacy of unprovenienced boxes of artifacts at local museums and libraries.

Competing with "pothunters" in destroying the archaeological record are construction activities. Since World War II with the increased need for housing and commercial centers, development of farmland and woods has been extensive. This rampant construction has destroyed some significant cultural resources. Some sites destroyed by development fortunately have been professionally tested (see example Wading River); others woefully were either the focus of an archaeological salvage operation or completely destroyed.

There has been some professional excavation and research on Long Island usually by lone individuals. In some cases the New York State Archaeological Association chapter's (Metropolitan and Long Island) have conducted various projects, both salvage and more research-oriented investigations.

The first "professional" investigation was under the aegis of M. R. Harrington from the American Museum of Natural History. At the turn of the century he conducted fieldwork at Shinnecock Hills, Port Washington, and Glen Cove. While his work was quite professional for its day, it lacked field observations, details on proveniences, etc.

M. R. Harrington's work was a pioneering effort in a professionally pristine territory utilizing a science which too was in an early state of development. In addition to Harrington, there were other serious investigations conducted by F. P. Orchard and F. H. Saville. All three fortunately published portions of their research and findings.

By the 1920's, Harrington moved into other geographical areas. During the remainder of the 20's and 30's there were still some avocational archaeologists digging with very little publication. Most of the work was limited to surface collecting and site identification.

Real progress did not resume until 1938, when Carlyle Smith and Ralph Solecki, two native Long Islanders with an interest in the past, began to work on interpreting the data base. It was the 30's and 40's which saw serious inquiry and research by the above two archaeologists.

The 50's saw landmark events towards establishing a serious dialogue which began to address the interpretation of Long Island's prehistoric and even historic past. Beginning in 1950, two important papers, Carlyle Smith's dissertation (1950), The Archaeology of Coastal New York and Ralph Solecki's (1950) M.A. thesis, The Archaeological Position of Historic Fort Corchaug, were made part of the archaeological literature.

It was also during this decade that Nassau County Archaeological Society was formed and began publishing a bulletin which addressed the local archaeological issues.

It was during the same decade that Ritchie (1959), then the State Archaeologist, conducted his field research at the Stony Brook site. This was published in 1959. Long Island was no longer a local phenomenon but had now become part of the regional literature.

The early 60's saw a new researcher, Bert Salwen, whose PhD. dissertation on coastal archaeology and addressed rising sea levels. His input and influence help change the complexion of local archaeology once again, moving the discipline into a more analytical/interpretative realm.

In 1967, Nassau County opened Garvies Point Museum, which was to be dedicated to local archaeology and geology. Throughout this decade and up into the 70's, this museum identified sites, did some analysis and published a few reports. While the museum was relatively well funded, the curators/archaeologists had other responsibilities such as exhibits and administrative functions. Thus the museum's research programs were helping to piece together the archaeological record, but it simply was not enough. Competing with these programs were both construction and hobbyists, who worked faster than any team could excavate and analyze.

The mid to late 70's saw the inception of the State University of New York at Stony Brook's Institute for Long Island Regional Archaeology. The Institute's primary function was and is to manage cultural resource surveys and prepare environmental impact statements for the local area. During this decade the University began to train professionals to specifically work within coastal archaeology. It was also during this time period that a politically active group of both professional and avocational archaeologists banded together to form the Suffolk County Archaeological Association. The group's two main contributions are the publication of a set of readers in archaeology and ethnohistory along with various educational programs.

The 70's and 80's also saw a move away from the descriptive and into the interpretative (see for example Ceci 1977; Lightfoot, et al. 1984, 1985, 1987). There was and is an increasing number of M.A. and PhD. studies now undertaken with topics pertaining to coastal archaeology. There has also been an increasing number of private firms which perform cultural resource surveys and reports.

Long Island archaeology has always been underfunded, with very little publication when compared to the amount of fieldwork undertaken. In overview, the work generally has been shouldered by individuals competing against the developer and hobbyist. A majority of the sites dug have been salvage operations by either professionals or avocationists. A few archaeologists (see for example publications by either Ceci or Lightfoot) have been linked to research oriented projects, and it is hypothesized that as this trend continues more pieces to the past will be found and interpreted.

DATA COLLECTION

Unfortunately, the concentration of archaeological fieldwork and theory rests on the investigation of the easily located and identified shell middens along the coastline. This type of site comprises the bulk of the literature and research. "While this practice has greatly enhanced our understanding of one aspect of coastal adaptation, the focus on shell middens has possibly, over the years, produced a rather distorted perspective of Long Island's prehistoric inhabitants" (Lightfoot et al. 1987: 1). This emphasis on one type of site has caused a serious bias in the interpretations of prehistory, a type of bias that is not uncommon.

"It seems fair to say that archaeologists have tended to select for excavation sites with the greatest yield of cultural items" (Binford 1972: 163). Binford has also noted that ". . . in selecting sites for excavation without a program of stratified sampling, high densities of cultural items cannot be used as a guide to selection without biasing the results" (Binford 1972: 180). Consequently, due to this bias and skewed perspective the lifeways of the prehistoric populations are poorly documented. Shell middens are now being recognized as only a part of the subsistence/settlement plan, not the sole locus.

Proper data collection from the shell midden is of paramount concern (Ceci 1984: 63) and depending on methodology and strategy, will determine the data retrieved. However, once strategy becomes standardized, and is repeated without review, the results will become mechanical and the data collected then may become redundant and unproductive.

The prior data collection process has also been affected by the lack of funds and manpower. This often leads to small excavations with time as the paramount concern. The kind of broad, extensive site investigation which provides good evidence of the presence or absence of postmolds can require many seasons of excavation at a specific site, not a few weeks or a couple of people over a few years.

Without new, creative research designs, unbiased data collection, better methodology, there is only a habitual method of excavation and field strategies which could lead ultimately to redundant data retrieval. It is only by constant reevaluation that a fresh, inquiring approach can be developed.

TYPES OF ARCHITECTURAL REMAINS

Postmolds are not only the remains of shelters but rather range from houses to drying racks, cooking tripods, miscellaneous stakes, food processing sheds, special huts, sweat lodges, stockades, etc. Unless there is a pattern, the remains recovered may not provide enough evidence for interpretation.

If a linear pattern is identified, these may be possible drying racks. At the Wheeler site in Massachusetts, two features were interpreted as drying and smoking racks. Each consisted of a 1-2 m fire pit surrounded by postmolds (Barber 1982). Such features may be indicative of drying and smoking scaffolds rather than shelters.

Brennan has also recovered what appears to be the remains of a smoking rack at the Twombly Landing site. However, he does acknowledge that these may also be the remains of shelters. "The only two features were the dated hearth . . . used over and over for cooking fires. It was surrounded by over 100 molds of what appeared to be stick supports for a simple roasting rack. Wickiup supports are also a possible explanation" (Brennan 1968: 27). Postmolds surrounding hearths also have been found at the Manakaway site in Connecticut (Suggs 1958). This is again probably the result of drying racks.

Both the remains of drying racks, special sheds or huts, and other miscellaneous uses should be available for interpretation. However the complete pattern may not be available due to intra-site activity and post-depositional changes. This may be compounded by the use of old midden areas, as new occupants settle or utilize the site. Later occupants might then fix their living area on an old refuse heap and deposit their refuse over a former living area (Darwin 1972: 182-183, Capriani 1966: 68, Waselkov 1982: 48). The final interpretation should be guided by the types of artifacts, features and faunal material found in association.

There is also the possibility that poles were not often used and stones were used as a foundation instead. In this case very few postmolds would be recovered. There is some evidence for this in the literature:

> ". . . a roughly 8 feet diameter circular arrangement of large water worn cobbles were uncovered. The stones, many in contact, averaged 10 inches in diameter, their undersides resting on midden subsoil. . . .

> At the southeast side of the circle in square 3D several stones were missing that would have completed the circle. This appears to have been the entry way of a habitation. . . . No conclusive explanation for the structures use can be made to the absence of associated postmolds or other shelter construction determinants. It is the author's guess that the enclosure was the foundation of some type of temporary dwellings . . ." (Kaeser 1963: 15-16).

The extent and use of this type of structure is unknown, but there are many rock clusters found on Long Island. This type of construction may also have been limited to temporary or special use buildings such as sweat lodges. Only additional research could supply the answers.

THE ETHNOGRAPHIC DATA

The use of the ethnographic record to develop predictive models for prehistory must be used with caution. In addition the use of analogy with ethnohistoric data for other Northeastern groups, while possibly applicable can be used only to explore the range of behavioral adaptation. Otherwise "[t]he free use of analogy would have made possible a much more detailed ethnohistory but a composite...Indian group that may never have actually existed" (Williams 1972: 2). Or in the case of considering shelters and their relationship to patterns of sedentism a fabricated prehistoric scenario often is developed that may only be partially if at all correct.

Shelters were affected by social organization, patterns of gathering food, religious life and history. "To understand the factors that form Indian architecture, one must look for what environmental and culture made possible, not inevitable" (Nabokov and Easton 1989: 16).

The way prehistoric people arranged their spaces and utilized dwellings reflects the way their society was organized as a whole. However, shelters "were not usually conceived as articles of permanent craftsmanship. Much of their building technology had an improvisational and practical flavor" (Nabokov and Easton 1989: 17). Shelters were practical and functional primarily to prevent their contents from spilling into the environment. The structural elements and their properties reflect the environmental influences anticipated along with the contents of the houses (Hunter-Anderson 1977: 295).

The basic shelter in the Woodlands was a structural frame of saplings to which was attached a covering of reed mats, reeds, grasses, and bark sheets. These were generally varied in shape, size, and use. It was generally a central space free of cultural debris, suggesting that it was a special place set apart (Morgan 1980: 3). On Long Island, specifically Brooklyn, the shelters were described in Jasper Danckaerts 1679-80 journal as being:

> ". . . low and long, about sixty feet long and fourteen or fifteen feet wide. The bottom was earth, the sides and roof were made of reed and the bark of chestnut trees; the posts, or columns, were limbs of trees stuck in the ground, and all fastened together. The top, or ridge of the roof was open about half a foot wide, from one end to the other, in order to let the smoke escape, in place of a chimney. On the sides, or walls, of the house the roof was so low that you could hardly stand under it. The entrances, or doors, which were at both ends, were so small and low that they had to stoop down and squeeze themselves to get through them. The doors were made of reed or flat bark. In the whole building there was no lime, stone, iron, or lead. They build their fire in the middle of the floor according to the number of families which live in it. . . ." (Danckaerts 1959: 55).

Another Description of shelters offered is as follows:

> "I saw there in a house well constructed of oak bark, and circular in shape, with the appearance of having a vaulted ceiling" (Hudson quoted by DaLaet in Jameson 1967: 49).

This small type of hut may have been used as a temporary residence during the seasonal round. During the contact period Indians moved periodically and thereby probably did not fix a great deal of importance to their shelters.

> "Some of them lead a wandering life in the open air with no settled habitations; lying stretched upon the ground or on mats made of bulrushes, they take both their sleep and food, especially in summer, when they go nearer to the sea for the sake of fishing" (DaLaet in Jameson 1967: 57).

Verrazano wrote that the Algonquian Indians he met near Long Island "change their habitations from place to place as circumstances of situation and season may require" (Nabokov and Easton 1989: 52).

The social organization and patterns of gathering food apparently did not require the use of massive or substantial shelters. But rather small dwellings were preferred and conformed to their lifestyles. There is some evidence that post contact natives did have "villages" or "wigwams" worth traveling back to after a seasonal stay elsewhere.

> "Others have fixed places of abode and dwellings built with beams in the form of an oven, covered above with the bark of trees, so large that they are sufficient for several families" (Hudson quoted by DaLaet in Jameson 1967: 57).

However, this type of pattern may not have been the case throughout the prehistoric period.

A more detailed description of the dwellings was provided by Harrington. The following account was based on information provided to Harrington by local Shinnecock and Europeans who had seen such structures during their youth. Similar structures were in use by other historical Indians and have been reported by Skinner (1902) and Solecki (1950).

> "Poles were bent into intersecting arches until a dome-shaped frame was made from ten to twenty feet in diameter. After all the poles had been tied firmly together and horizontal strips put into place, the whole was thatched with a species of grass, called "blue vent" put on in overlapping rows and sewed fast to the strips. When the top was reached a hole was left open for the escape of smoke, and the edges of the aperture plastered with clay to prevent the thatch from catching fire. The ground plan was circular or oval, sometimes divided into rooms by partitions of wattle and thatch. The door frame was an arched pole. . . . An elevated bench or couch of poles encircled the interior, beneath which goods were stored. In at least one case where poles were difficult to procure, the floor was dug out in the middle. . . . The fireplace was in the center. . . . " (Harrington 1924: 243).

The above described shelters did make use of poles set into the ground for support construction.

The shelters were typically circular (see descriptions offered by Williams 1972: 14). Some had a fireplace in the center, with a corresponding hole in the roof. While these are possible models, they are historical or post-contact ethnographic accounts. It is possible that the local cultures were profoundly changed and a different strategy of housing adopted after contact. Other variables derive from the season and place of construction.

In the spring and summer sites of the Late Archaic Riverton Culture in the Midwest clay platforms or living surfaces were established directly on the growing midden (Winters 1969). The clay platforms appeared to have been kept clean of accumulating debris; however the shelters were virtually surrounded by rotting garbage (Winters 1969). This apparently was not uncommon. After several years captivity among the Karankawa in the early sixteenth century, Cabeza de Vaca related that those people had "cabins of mats and erect them on heaps of oyster shells, upon which they sleep naked" (Waselkov 1982: 48).

While there are probably numerous instances where populations of one particular culture may have erected shelters on a growing shell midden, there were probably those that selected sites either adjacent or some distance away. Thereby the remains of shelters might not be found on or in the shell midden. It would not be unusual to disassociate activity area and shelters.

Both of the above models may be applicable to coastal New York depending upon subsistence, settlement, time period and culture.

OTHER CONSIDERATIONS

Other considerations when investigating postmolds should include not only the type of site but also the probability of finding postmolds. Some sites, although permanent habitation areas, simply may not provide a wide range of evidence due to the amount of disturbance and subsequent destruction on the part of prehistoric peoples, as they continued to modify and rearrange their utilization of the area. This could occur also as the occupants worked and lived within the site (see Gifford 1916: 11, Maggs and Speed 1967: 86 and Waselkov 1982: 56).

Consequently all sites with the exception of obvious bulk processing stations (see for example Cedar Creek, Chapter V) should be considered as possible candidates for associated structures. It is not advisable that unsupported and random assumptions be the guidelines for determining research strategies and site sampling. This may be possible in the future, but only after the prehistoric record is more fully interpreted and understood.

The total absence of evidence pertaining to architectural remains is almost inconceivable. There is ethnographic documentation to support the use of shelters along with some data from the archaeological record (see Chapter III). It would have been improbable that the Island populations would have lived here without shelters given the local climatic conditions.

Instead of lumping all possible shelters into the flimsy house category (see Ceci 1977), assuming that they do exist, we must consider the third possibility, that they have been overlooked. The reasons why and how they have been overlooked will be analyzed in the latter portion of the paper.

Instead of the current alternatives of looking to either the old theories or to the new (see Ceci 1977, Silver 1980), the first goal is to systematically and properly investigate the reasons behind the paucity of postmolds and then begin to understand what this means. Although this could be perceived as another cog in the old defense of "what if" or "it could have been if" (see Ceci 1982: 9) type of argument it still is the most reasonable approach. It should be admitted that past research has not always been systematic or goal oriented. Once again the "inept investigations and modern construction (has) somehow selectively destroyed all the good evidence" (Ceci 1982: 9).

Until new and more conclusive evidence is discovered, any model or theory may be resting on weak supports. The past models presented do not satisfactorily explain past issues regarding shelters and site occupation, and the fault partly is in the lack of architectural evidence. It is only with supportive documentation and new data that any theory can be viable and provide a basis for hypothesis testing and building.

The issue of shelters and site utilization are important variables when considering settlement/subsistence patterns. And "when the history of American archaeology is written, the concept of settlement archaeology will probably be viewed as one of the major contributions of the mid 20th Century" (Fitting 1969: 360). Unfortunately for Long Island this may occur closer to the 21st Century.

CHAPTER III

THE DISCOVERY OF POSTMOLDS ON LONG ISLAND TO DATE:

THE DATA BASE

There have been postmolds or evidence of architectural features discovered on Long Island. While rare, they are not as rare as the literature represents (see for relevant comments Ceci 1977, Wyatt 1977, Gwynne 1982). An overview is presented in Table 2 of the postmolds found to date. It is within the last five years that an inland site, Twin Ponds provided well over 10 postmolds (Lightfoot 1986). Unfortunately, the analysis of these postmolds is still incomplete. The postmold remains in Table 2 include not only shelters but drying racks and other miscellaneous usages. All the remains recovered to date provide evidence that with due diligence, this type of feature can be indeed found.

An important consideration in identifying postmold remains is when is a postmold a postmold. One criteria traditionally used is the pointed end (see for example the description rendered in Chapter II, Brennan 1973). This may very well be a possible or even probable physical characteristic, however it is not mandatory. Nor does the pole have to enter the soil vertically. Some postmolds at the Assa Wompset site appear to have been purposely angled out, possibly so the poles tensile strength would be increased once they were bent inward. Consequently, the walls would lean outward and the overhanging eaves would keep rain from dripping straight down (Nabokov and Easton 1987: 57).

Postmolds could also be rounded or blunted depending on the purpose and method of placement of the pole. It might be advantageous to consider all potential shapes, utilizing soil analysis for supportive evidence (see for example State Service for Archaeological Investigations 1966 for explanation of field techniques; Dincauze 1976 for use of soil analysis for evidence of organic components). In addition, many a researcher mentions rootmolds but never a postmold. Perhaps a more liberal interpretation regarding shape combined with supportive physical analysis (as discussed above) might be a more productive approach.

There also appears to be a trend that only certain people find and identify postmolds. This may be contingent upon the types of sites selected by researchers hoping to satisfy their research designs. A second possibility is that these researchers are more sensitive to the possibilities or probabilities.

Rather than blindly approaching the problem of location and identification of postmolds, perhaps a study of artifacts and features "commonly" found in association might be helpful in establishing a working model. Such a beginning approach has been distilled and tabulated in Table 1, a procedure potentially beneficial in detecting patterns that could signal the researcher during the field data collection period. However, the Crystal Brook site where no features were found associated cannot be ignored. Here may be a type of dwelling, the

TABLE 1: KINDS OF FEATURES ASSOCIATED WITH POSTMOLDS

SITE NAME	BAKING PITS	HEARTHS	BURIALS	STORAGE PITS	LITHIC REMAINS AND/OR HOUSEHOLD DEBRIS
BULL CALF LANDING					X
MUSKEETA COVE					X
AQUEDUCT	X	X	X		X
STRONG'S NECK	X	X	X		X
LIVINGSTON POND		X		X	X
TWIN PONDS					X
SMITH SITE		X	X		X
CRYSTAL BROOK					X
PIPESTAVE HOLLOW	X	X			X
ENGLEBRIGHT				X	X
SHINNECOCK HILLS		X	X	X	X
SUNGIC MIDDEN SITE		X			X

TABLE 2: POSTMOLD ANALYSIS

SITE NAME	LOCATION	SEASONALITY	TYPE	NO. OF POSTMOLDS	INTERPRETATION
BULL CALF LANDING	CENTERPORT	SUMMER?	SHELL MIDDEN	15	HOUSE REMAINS?
MUSKEETA COVE	GLEN COVE	UNDETERMINED	SHELL MIDDEN	24	DRYING RACKS
AQUECUCT	AQUEDUCT	UNDETERMINED	BURIAL & HABITATION	14	HOUSE REMAINS
STRONG'S NECK	SETAUKET	UNDETERMINED	BURIAL & CAMP	15	HOUSE REMAINS
LIVINGSTON POND	LLOYD'S NECK	ALL YEAR	SHELL MIDDEN	10+	UNDETERMINED
TWIN PONDS	MIDDLE ISLAND	UNKNOWN	INLAND SITE	10+	UNDETERMINED
SMITH SITE	SHELTER ISLAND	ALL YEAR	BURIAL & CAMP	UNKNOWN	HOUSE REMAINS
CRYSTAL BROOK	MT. SINAI	UNKNOWN	LITHIC/ POSS. HABITATION	7+	HOUSE REMAINS
PIPESTAVE HOLLOW	MT. SINAI	ALL YEAR	SHELL MIDDEN	20+	HOUSE REMAINS
ENGLEBRIGHT	MT. SINAI	ALL YEAR?	SHELL MIDDEN	2	UNDETERMINED
SHINNECOCK HILLS	SOUTHAMPTON	ALL YEAR?	SHELL MIDDEN & BURIAL	UNKNOWN	HOUSE FLOOR DISCOVERED. UNKNOWN IF POST-MOLDS WERE ALSO FOUND
SUNGIC MIDDEN	SHELTER ISLAND	FALL, SPRING SUMMER & EARLY WINTER	SHELL MIDDEN	5	UNDETERMINED ARCHITECTURAL REMAINS

product of a specific set of events or circumstances, that left little or no physical trace. Additional research may resolve this puzzling problem.

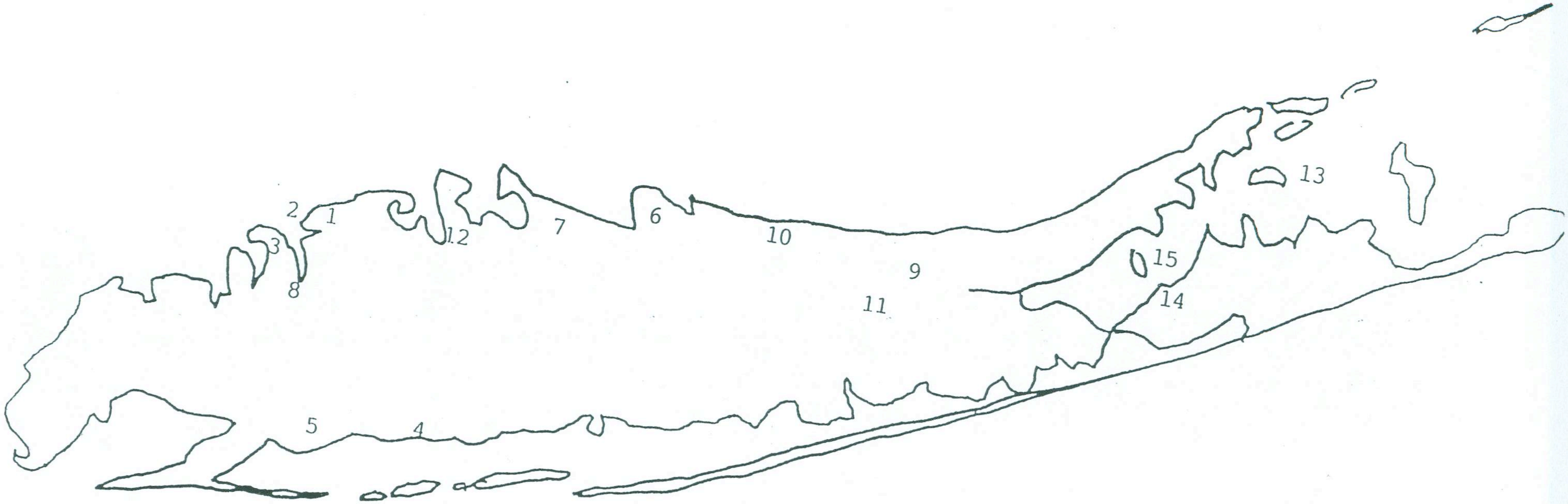
The following is an overview of the current record as gleaned from the literature and interviews (see Tables 1 and 2). Fort sites and all clearly post-contact sites were not included in the sample. This discussion is limited to what is perceived to be occupation/habitation sites. It is only by analysis of the prior history of site research that a solid foundation be established. This can ultimately become the basis for future research. All site locations are included in Figure 1. The reader is referred to the referenced reports for complete descriptions and site interpretations.

THE MUSKEETA COVE SITE

Twenty-four postmolds were found at this Woodland site which was located at a relatively protected locale in Glen Cove. The postmolds were found both within and just outside of the midden and described as being visible as dark circles ranging from two to six inches in diameter in a sand matrix, in Occupation B (Salwen 1968: 324). Interestingly, they appear to form no particular pattern except for a straight line across the site from southeast to northwest.

Midden B has been interpreted by Salwen (1968) to be a Late Woodland residential base which was used as a special-purpose processing station. Salwen has interpreted this site as Woodland, based on the artifactual assemblage. The most diagnostic artifacts included pottery

FIGURE 1: MAP OF LONG ISLAND AND SITE LOCATIONS



1. Tick Hollow, Glen Cove
2. Muskeeta Cove, Glen Cove
3. Motts Point, Port Washington
4. Cedar Creek, Wantagh
5. Aqueduct, Aqueduct
6. Strong's Neck, Setauket
7. Bull Calf Landing, Centerport
8. Oakland Lake, Bayside
9. Wading River and Shoreham, Wading River
10. Mount Sinai Sites: Hopkins Landing, Crystal Brook, Englebright & Pipestave, Mount Sinai
11. Twin Ponds, Middle Island
12. Livingston Pond, Lloyd Harbor
13. Smith Site, Shelter Island
14. Shinnecock Hills, Southampton
15. Sungic Midden Site, Shelter Island

and based on the physical characteristics were assigned to the Bowmans Brook focus of the East River tradition (Salwen 1965: 239).

The postmold remains appear to have been located both within and outside the midden boundaries. It is possible, that intrasite activities combined with post-depositional environmental factors have obscured any discernible pattern. Drying racks may have indeed been the reason for the remains (see Barber 1982: 29, for discussion) due to the lack of a regular spatial pattern. A more regular pattern might have been indicative of house remains.

The fieldwork on this site was begun by Ed Patterson, an avocational archaeologist and was continued by Columbia University under the direction of Bert Salwen. The excavation area was relatively small and was limited to what was evidently the inland edge of a larger site. The southern portion was either destroyed or lies under the roadbed (Garvies Point) (Salwen 1968: 322). This construction is partly to blame for the obscurity of the recovered postmolds along with destroying any other potential finds. If this site was found intact the architectural remains may have been not only more abundant but also more revealing.

THE AQUEDUCT SITE

In 1939, during the construction of the Belt Parkway, near the head of the Hawtree Creek, an aboriginal site came to the attention of the Flushing Historical Society. They immediately set out to do a little "spade testing" and found a skeleton and fourteen postmolds which occurred around the burial pit. These postmolds were found both inside the burial and in the surrounding area. This was considered to establish "contemporaneity with the site" (Solecki 1950b: 46). Analysis of the pottery placed this site as Late Woodland. This appears to be an accurate evaluation of when this site dates from. However, the use of carbon 14 dating would have provided supportive documentation.

The postmolds were physically described as having a "sharp", clear demarcation in the yellow sand. The distance from the pit periphery ranged from one foot, four inches to two inches with an average of six inches (Solecki 1950b: 44). The postmolds averaged about seven inches deep and were about one to two inches in diameter. Some of the postmolds tapered toward the bottom (Solecki 1950b: 44).

Solecki (1950b) interpreted this arrangement as a possible burial inside a former house structure. In addition, Solecki also considered it a "well documented fact" that the Indians often fenced their graves as a form of protection (Solecki 1950b: 47). However, Solecki (1950b) notes that most, if not all, burial sites examined on Long Island do not have evidence of shelters around the grave.

The household refuse and food remains found in association with the burials suggests that this was formerly a residence. The occupant or relative may have died, and she along with a small infant were simply buried within a handy refuse pit which readily served as a grave within the confines of the house. Immediately afterwards the house was probably abandoned, leaving a relatively pristine record. Certain Indian groups in New England were also reported to have had the "custom of removing their habitations at the death of any" (Johnson 1910: 41). It is doubtful that such a structure was built with the intent of housing the burial although it is not impossible.

THE STRONGS NECK SITE

At the Strongs Neck site in Setauket, a house or rather the remains of a house were found by an avocational archaeologist, Ben Werner. Unfortunately, only half of the house was documented, the other portion being destroyed by bulldozers clearing the land for construction. The postmolds were small discolored spots about 1/2" in diameter, almost round and each was about 5 1/2" from the next (Werner 1982: 206). The site was characterized by Werner as a "plow scattered shell midden" (Werner 1982: 202). The remains of this dwelling were probably found within the area of greatest concentration of artifacts and features.

There were a total of 13 postmolds running in a large half circle (see Werner 1982) with two additional postmolds being located outside of the main circle. The structure was circular, about 12 inches in diameter with a floor thickness of about three inches and each post was between five-and-a-half to six inches apart. In association with the house floor were quartz debitage, very small shell fragments of various species, worked chert and a historic nail. There may have been one other house floor at this site which was destroyed by the initial construction work, as lumps of clay mixture that appeared identical to the remaining floor were found in the heaps of bulldozed topsoil (Werner 1982: 209).

This site also yielded burials, cooking pits, one hearth and some colonial artifacts which may have very well indicated a Late Woodland/Contact period site. Nevertheless, there is a significant amount of aboriginal material to suggest that the occupants were not significantly affected by European culture due to the limited amount of historical artifacts.

The excavation at this site was essentially an early salvage operation. Consequently, the fieldwork was limited and confined to the more elaborate features which in this case was a burial and the dwelling remains. Considering the nature of the recovery, data retrieval was productive. This site appears to have provided some data on a Late Woodland/Contact period dwelling.

BULL CALF LANDING

This site was once a rather large shell midden in Centerport, just off Route 25A, which was bulldozed, after an archaeological report was filed by Edward Johannemann of the Long Island Archaeology Project, SUNY-Stony Brook in 1982. It was a rather well known midden site and the area was repeatedly pot hunted.

The Long Island Archaeology Project conducted a surface reconnaissance along with digging a few subsurface shovel test pits. In the area which was to be impacted by the construction of residential homes, three two meter squares were excavated. In the final report this area was classified as "sensitive" and it was recommended that archaeologists should be present during the construction phase.

However, it was after this site was bulldozed and came to the attention of local avocational archaeologists that any salvage work was undertaken. It was during this time that a series of postmolds were uncovered which appeared to be in a semi-circular pattern. Unfortunately, there is virtually no data on the artifacts or additional features in association with these postmolds. Based on the size of the midden and the types of artifacts recovered (food remains, pottery, decorated pendants), this site was probably the remains of a permanent Woodland residential base. While these postmolds are hardly conclusive, they are nevertheless one of the few documented remains from this site.

However loosely, the fifteen postmolds do suggest the remains of a structure of some sort (Figure 2). In one set the postmolds are fairly evenly spaced at about one foot and the structure may have been about four feet wide. The second may have been more like seven feet wide. Due to the salvage nature of the excavation, it was not readily ascertained what other features were associated. The two separate structures appear to have been circular or oval and in relatively close proximity to each other.

This site could have been quite significant for prehistoric studies on settlement and/or subsistence, particularly since (as based on the faunal remains) it appears to have been occupied all year round (see Schraff 1983: 4, 62).

SMITH SITE

On Shelter Island, at the multi-component Smith site, Roy Latham, an avocational archaeologist and naturalist excavated a line of post-

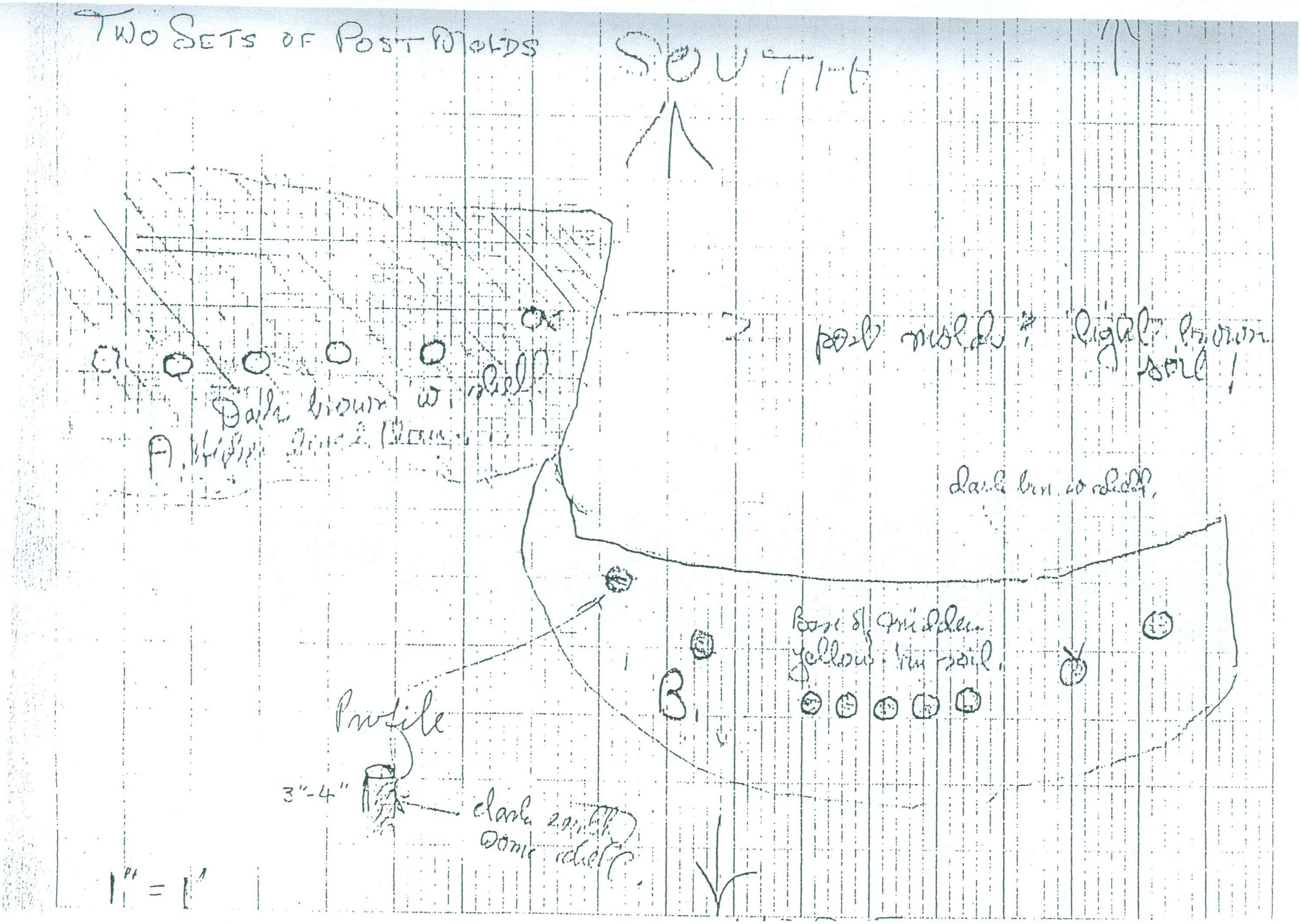


FIGURE 2: Field Diagram of postmolds from the Bull Calf Landing Site. Site Map drawn by J. E. Truex.

molds which were outside a hollow depression. He described the "houses" which he found as:

> "The floor of these winter lodges were 12 to 16 inches thick of broken, crushed and trampled quahog shells, leveled flat. On these had been built elevated stone hearths up to a foot in height, with an opening at the top to support a painted bottom pot. About 7 to 8 feet outside the floor on the north side was a line of postmolds but none could be detected on the other sides" (Latham 1957: 1).

These may have been the remains of houses. Interestingly in this particular example there may be a relationship between the dwellings and the hearths. As previously discussed this relationship is a common find to upper New York State and elsewhere in the Middle Atlantic and New England region. However, postmolds can appear independently of a hearth feature (see for example Gwynne 1984). Unfortunately, Latham does not hypothesize on when these possible dwellings date from. It was inferred by Latham they were utilized during the Woodland period (see Latham 1957: 1). However, this is speculation and not based on any clear association. It is also unknown as to how and why this site was excavated.

TWIN PONDS SITE

At the Twin Ponds site, in Middle Island, at least ten postmolds were identified. This is a large inland site, 1.5 hectares, and may even be the largest found to date on Long Island. Fieldwork was conducted by SUNY-Stony Brook and Queens College archaeological field schools.

The postmolds were found five to six cm below grade and were five to eight cm in diameter. Unfortunately, the postmold pattern is unknown. Lightfoot's (1986) preliminary analysis identified this site as a possible Woodland inland habitation area which has yielded significant and substantial (unlike most inland sites on Long Island) artifacts and features. It has been estimated that there are well over 10 postmolds found at this site (Lightfoot 1986). These postmolds are classical in appearance and taper down into a sharp, rather well defined point in cross-section. This is exciting support for the premise that architectural features can be found at inland sites.

SHINNECOCK SITE

During the first half of the 20th Century, two probable "wigwam" (Harrington 1924: 238) floors which may have been post-contact were found at the Shinnecock site at Sebonac Creek. These dwellings were oval, about fifteen feet wide and twenty feet long of stained earth. In the center was a fireplace, which reached a depth of three feet (Harrington 1924: 238-39). The floor of the dwelling was also below grade by two to three feet. This floor averaged 27 inches. In the immediate area were ceramics, deer antler, a whale's lower jaw bone, bone awls, animal bone, flint chips, shells and charcoal (Harrington 1924: 238-39). This probably, as suggested by Ceci (1977: 57) was a year round occupation, as supported by the deer skull fragment with an empty pedicular and also a shed antler.

These dwelling sites were found by employing the technique of excavating trenches or long large holes. By Harrington's own admission the relics were the sort after commodity, rather than the data pertaining to settlement, for example shelters (Harrington 1924: 234). It was probably due to the large scale approach and exploitation that these remains were discovered at all. Harrington also identified "wigwam" sites at the Matinecock site (Harrington 1899). These were apparently circular hollows filled with stained earth and shells.

Harrington's curiosity was piqued and he did seek additional information regarding shelters and site occupation by interviewing local informants on "Indian" dwellings. Harrington's description, based on the collected information revealed an oval house with a fireplace in the middle (for a complete description see Harrington 1924: 243, and Figure 16 of the same). It is important to remember that the description given by Harrington was based upon the relatively recent memory of the local Indian populations. Their recollections would have been of a culture already modified by European influences.

While the house floors are not postmold remains they nevertheless demonstrate evidence of shelters and a model for future investigation. Whether or not the postmolds were absent due to oversight, disinterest or poor archaeological techniques and excavation (or a combination of all of the above) will probably never be known.

This site is most likely Woodland through to post-contact. While the bulk of the artifact assemblage is Late Woodland some of the artifacts were "articles made by the Whites of the Colonial period" (Harrington 1924: 243). It is unknown when the dwellings date from. Therefore, the description presented at this site may not be completely applicable to interpretations of the prehistoric periods on Long Island.

CRYSTAL BROOK SITE

At this Mount Sinai site, seven distinctive postmolds were recovered. These remains appear to suggest a round building about two meters in width (Gwynne 1984: 4). Physically, they had the classic or expected appearance of a small circle which upon cross-sectioning tapered to a blunted point at the bottom. Spatially, they formed an awkward circular pattern. These stains may represent an oblong structure with rounded ends, which depending on its length, could have been quite roomy inside. This was one of the first Late Archaic house patterns found as based on the artifacts found in association with this feature.

Inside the circular postmold pattern were 22 quartz flakes, a partial bifacial scraper, one chert flake and one Late Archaic narrow-stemmed point. Outside were a concentration of quartz chips and one gray black chert chip. These latter artifacts are probably from the back fill to support the posts. In summary, all around and within the dwelling were scattered lithic debris.

Interestingly, 20 meters away in another square, the same soil type was encountered, at approximately the same depth (43 cm). However, "no round soil stains were observed...the appearance of these stains in one square at the lack of them in identical soil condition in a nearby square at the same level strengthens the contention that the stains were indeed postmolds" (Gwynne 1984: 4). Apparently the spatial organization of these stains does not support the possibility of a natural or geological deposit.

Analysis of the size of the postmolds suggests that there was formerly a substantial structure, one which could support walls and a roof of any of several different materials (thatch, wattle and daub, and/or skins) (Gwynne 1984: 527). This could have been either a summer, winter or year round dwelling. Based on ethnographic analogy, a flimsy impermanent shelter would not have required such substantial supports. Whereby, either a cold weather or long term occupation or both may be implied. Such curvilinear floor plans, have been associated with both nomadic and sedentary peoples. Therefore, no prediction can be made based on shape alone (Gwynne 1982: 526).

This site could serve as a model or example of what may be awaiting discovery and identification from the Late Archaic. This type of house may very well have been common during the Woodland periods as well. A second consideration is that this site does not fit the typical expected pattern as found in other nearby locations (see for example Ritchie 1980 and Ritchie and Funk 1973). Instead, Long Island dwellings may be found to be represented by a few lonely postmolds, and a relatively light scattered debris. Such features as fireplaces or hearths may not be necessarily found in association.

ENGLEBRIGHT SITE

At this Mount Sinai Late Woodland site, two postmolds located near storage pits were discovered. In profile, these appeared to represent a bluntly pointed pole, 10-15 cm in diameter (Gramley and Gwynne 1979: 8).

These may or may not be the remains of dwellings, but rather some other features such as drying racks. This site was dated based on the artifact assemblage and the postmolds are assumed to be from the same time period.

PIPESTAVE HOLLOW

This Late Archaic-Late Woodland site at Mount Sinai harbor, dated on the basis of charred nuts recovered from one of the many cooking features yielded a C14 date of 1250 A.D. (700±115 B.P., GX-4894, C13 corrected). The 29 postmolds exposed have been interpreted as the remains of a dwelling and in the immediate vicinity were three pairs of hearths. Another set of hearths were located to the south which may be the remains of additional dwellings. Unfortunately, this area was badly disturbed.

The floor of this dwelling site had numerous fragments of triangular quartz points. "The artifact assemblage that can be confidently associated with the Late Woodland features and posthole pattern is small and fragmentary" (Gramly and Gwynne 1979: 14). One feature yielded the same type of debris. All of the evidence, which included not only the presence of structural remains but also a great amount of deer bone, charred nuts and a sparse amount of shellfish all hint at a fall to winter occupation (Gwynne 1982).

The Mount Sinai house pattern has been classified by Gwynne (1982, 1984) as curvilinear, but unfortunately, this type of floor plan is not useful in predictions regarding settlement patterns (Whiting and Ayres

1961: 124).

At the Pappalizio property locus, a mixed Archaic/Woodland deposit, at least three postmolds were found by Michael Gramly, then of SUNY-Stony Brook. These were similar to the Englebright site postmolds, and were found by storage pits and hearths. Due to the presence of structural remains, the amount of deer bone, and the presence of charred nuts in the hearth bases it was interpreted that in Woodland times Pipestave Hollow was occupied in fall and winter. These postmolds were assigned based on association to the Woodland period.

Unfortunately, the evidence was not particularly enlightening and these features may be representative of almost anything. At this site, much of the area had been subjected to occasional storm washovers, which left a coarse sand and gravel that made identification virtually impossible.

SUNGIC MIDDEN SITE

This is a Middle-Late Woodland midden site on Shelter Island which was interpreted as a residential base with three separate occupation episodes (Lightfoot et al. 1987: 100). There were diverse activities represented including lithic production, ceramic industry, butchering, plant processing, cooking etc. (Lightfoot et al. 1987: 117); all evidence of daily living. Faunal remains comprised shellfish, deer and waterfowl (for a complete description see Lightfoot et al. 1987). Based on the shellfish remains as analyzed by cross-section a spring/summer, fall and early winter occupation was represented. The only period missing was winter to late spring.

It was at this site that five small postmolds were found which may have been associated with the hearth feature (Lightfoot et al. 1987: 116). While the principal investigator, Kent Lightfoot of SUNY-Stony Brook and field school did not find overwhelming evidence of architectural remains it was addressed accordingly:

> "The question of whether house structures were excavated in these sites remains debatable. Our excavation strategy did not delimit broad continuous areas necessary to define the spatial patterning of individual residential structures. However, several postmolds were recorded at the Sungic Midden site" (Lightfoot et al. 1987: 12).

However, the accomplishment of finding postmolds is a noteworthy contribution.

SUMMARY

An overview of the current data base, provides a few deductions and points of speculation. One of the most important is that postmolds have been found generally by luck and happenstance. In addition, overviews of the circumstances of excavation also provide interesting information. Both Pipestave Hollow, Englebright site and Sungic midden were all excavated by SUNY-Stony Brook's Department of Anthropology as part of their field school program. The relatively intensive investigations of many researchers over a season may help to provide the broad testing needed to expose these types of remains. Postmolds have also been found both within and outside the midden at both types of sites, coastal and inland. And Archaic/Woodland and Woodland/Contact sites have all left architectural evidence.

Those postmolds which have less apparent patterning may be the result of partial obliteration of the record or of other household operations. There are also different models of dwellings, those with features found in association (such as hearths and storage pits) and those without. It cannot be ascertained at this time which is the most common type. It is however obvious which type of model is more easily identified and looked for.

The baffling record of postmolds derives from both poor preservation and the field data collection methodology. The lack of incorporation of postmold search procedures in many research designs is also a factor (Lightfoot et al. 1987: 126). Another important consideration is the post-depositional history of a site which would include all activities on a site immediately after a feature was established. The impact of daily living by the occupants upon the site has been relatively ignored in Long Island archaeology. Such a variable and the subsequent hardships these sites suffered may have obscured both patterns and remains.

CHAPTER IV

CURRENT INTERPRETATIONS AND THEORIES

The overview as presented in Chapter III has confirmed that postmolds, however rare and inconclusive the evidence, can be indeed found as the remains of shelters or as other architectural remnants. Now that the current data base has been examined, the next consideration (and the purpose behind this chapter) is why postmolds are and remain to be such a sparse commodity on Long Island.

During the last two decades, the archaeological record has been made to bear the burden of the blame. Cited as the classic whipping boys are the poor soils and the undeniably overwhelming amount of both residential and commercial construction (see for example Bull Calf Landing, Centerport and Wading River/Shoreham, Wading River). While it is undeniably true that the soils are unyielding, and that the amount of construction is a major cause of site destruction, the archaeologist's role in this dilemma has rarely been examined.

Typically archaeologists do not anticipate or expect to find postmolds in Long Island sites. Usually, it is a most unexpected and delightful surprise when this discovery occurs (see for example Gwynne 1984; for a case in point see Ceci 1977). Unfortunately, the development of appropriate or sensitive research designs towards the identification and location of postmolds is virtually non-existant.

> "Fieldwork and laboratory studies need to be directed toward very basic issues concerning coastal subsistence and settlement patterns. Most importantly, theoretical models need to be generated in order to evaluate the archaeological remains of Long Island" (Lightfoot et al. 1987: 19).

In part, this dilemma results from the methodology employed in research. Most of the archaeological investigations undertaken on Long Island have been derived from accidental discoveries, casual walkovers, and interviews with local avocational archaeologists or pothunters. Consequently the most noticeable and largest sites tend to be reported. As Alexander (1983) and Lovis (1976: 364) and others have noted, such a practice can produce significant biases in kinds of cultural resources studied by archaeologists (Lightfoot et al. 1984: 12). Then it should be no surprise that 82% of all sites excavated were shell middens (Lightfoot et al. 1984: 9). With this type of sampling error, there would almost have to be some misrepresentation.

Given that the emphasis on shell middens is a source of bias, the problem is further complicated by the limited excavations and sampling procedures that are typical. "As Ceci (1982: 7) . . . and others noted, there have been relatively few full scale excavations of sites (Lightfoot et al. 1987: 8). This is partially due to underfunding, understaffing and short-term commitments on the part of the archaeological community. However, this can be taken one step further.

Unfortunately, a great deal of the research conducted has been undertaken by avocational archaeologists (those individuals with little to no formal education). Some of the work provided by these people are certainly worthwhile. However, the lack of formal training will hinder the ability to formulate research designs, know proper archaeological techniques, etc.

In addition, it is no longer acceptable on Long Island (or anywhere) to conduct salvage archaeology with only one or two goals in mind. One must attempt to retrieve as much information as possible and not to limit oneself to saving a few artifacts. Partial information only provides fodder for debates and conflicts (see for example Ceci 1977, Ceci 1982, and Silver 1980). Strategies must be designed and implemented which lead to a holistic interpretation of a site, not just a portion or a particular interesting aspect. The lunch of prehistoric peoples cannot be the centerpiece of archaeological research. Instead all data possibilities must be equally considered. Also poorly documented areas of research need to be addressed.

Often, the archaeological community's expectations and attitudes act as a bias in determining what cultural remains are found and identified. These expectations and attitudes can be gleaned from the literature itself. When local archaeologists were interviewed for purposes of this paper it was generally acknowledged that postmolds had occasionally been looked for at one or two sites but never located. When it came down to examining their own research designs or strategies, they were often vague and ambiguous.

Generally, any deviation in the local standard archaeological practices are rare. Usually the methodology of data retrieval is redundant and does not often provide any significant data regarding subsistence/settlement patterns. The primary emphasis is rather on site location and artifact identification (for additional emphasis on this issue see Lightfoot et al. 1987: 8).

A case in point of finding only the confirmation of expectations can be found in the survey conducted by Edward Johanneman. His survey strategy of all the Suffolk County Parks was based on the already available historical and archaeological literature and the reports of informants on site locations. These emphasized localities around water sources (Johanneman 1982: 3, 4 and 10). Therefore the sites found were all around water sources, including those previously known (see Johanneman 1982 for a full report on methodology and results). While these are indeed valuable confirmations, they ultimately only serve to confirm old patterns, skew the archaeological record and perpetuate poorly constructed models or theories. Two myths that the results support are that all sites are located near water and secondly that most of the significant sites have already been located.

For decades these approaches and attitudes have hampered research on inland sites and how these sites fit into the overall scheme of Long Island subsistence/settlement patterns.

It is relatively recently that some archaeologists have recognized (Salwen 1970: 3, Wyatt 1977: 408, Lightfoot et al. 1984, Lightfoot et al. 1987) the bias in overemphasizing shell middens at the expense of other types of sites. Actual settlement patterns may be diversified and complex, with the shell midden sites representing only "one component of a much larger subsistence/settlement system" (Lightfoot 1984: 41).

Long Island archaeology no longer needs confirmations of old models but instead fresh methodology and research designs. Unfortunately, many of the older and, in fact, newer theories are inadequate when closely examined (see Ceci 1977, Silver 1980). The older models may very well be accurate, as far as they go, but they certainly need additional and better support. And as probably is the case, many of the older theories need to be altered and modified. But this cannot occur until many unproductive research habits are broken. After all, ". . . the purpose of the model of subsistence and settlement decisions is to provide a coherent set of expectations which can be compared to the archaeological data" (Jochim 1976: 165).

It may have to be accepted that strategies for identifying and locating architectural remains may lead to evidence that is rather unexciting and limited. But the recovery of such data would provide valuable information for future field strategies and theory building. Negative data can often be as important as the recovery of cultural remains.

Instead of assumptions or generalized statements, avenues of study which could be pursued towards the identification of architectural remains could be developed. There are two myths which should be more closely examined. The first is that all sites are a homogeneous class. But rather there is a wide diversity of settlement types (Sanger 1981, Barber 1982). The second myth is that the site ends at the shell midden's edge. As Salwen (1968) and Wyatt (1974) have demonstrated by the Muskeeta Cove and Wading River/Shoreham sites, this is not always the case.

The remainder of this chapter will examined these myths in relationship to the discovery of architectural remains. However, it is not until there is a practical field testing at different types of sites can the productivity of such studies be evaluated. The value in such testing, be it negative or positive in results, is that it provides a data base on which one can build.

THE MYTH OF THE HOMOGENEOUS SITE

Shell middens, shell bearing sites and perhaps to a lesser extent inland sites are not homogeneous deposits, but rather represent past remains of different and varying actions and behaviors. The heterogeneity can be recognized not only from category to category but also within the individual site class itself.

It is now generally recognized that shell middens embrace a wide diversity of settlement types (see for example Luedtke 1980, Sanger 1981, and Barber 1982). An example of this is Morrill Point, where there is a dramatic differentiation between shell middens from the eastern and western points of land (see Barber 1983).

Since the activities which once took place upon a midden or the life span for such a deposit is not well understood, there is a fundamental difficulty in reconstructing the process(es) of accumulation. There are often confusing arrays of shell lenses that dip at various angles and terminate abruptly, confusing the most adept fieldworker. It has been proposed that shell middens were built up by a succession of dumping episodes. The inhabitants returned again and again to the same general area until in time the debris completely covered the ground, thus creating a continuous midden which actually consists of many small, individual overlapping shell heaps (Byers and Johnson 1939: 192).

Later occupants might then fix their living quarters on or near an old refuse heap and deposit their refuse over a former living area (Darwin 1972: 182-83, Cirpriani 1966: 68). This may be cause enough to start seriously taking apart the midden itself. In some regions (see Waselkov 1982: 48 and 49), shelters have been built on old heaps and in some cases structures were built on depressions dug into the midden. However, it is not until there is more information on both the depositional history as well as post-depositional activities, that the various sections of a midden will be accurately identified, or that the relationship between artifacts and shell strata will be understood.

For example, artifacts recovered from one part of a site may not be contemporaneous with specimens from the same depth located elsewhere in the midden. This possibility should be seriously considered when site investigation are undertaken.

Another interpretation of shell midden deposition is that individuals using a site will occupy one area for a period of time but as the debris gets deeper, they will move to a new or adjacent part of the site. Thus the accumulation of a midden may occur not in layers but in heaps (Salwen and Vetter 1974). This example of shell midden accumulation can be found at the Kaeser site (Rothschild and Lavin 1977: 2) where there was an occupation of different areas of the site at different times. If this hypothesis is correct in the majority of cases, most shell midden sites excavated to date probably require additional testing and analysis.

In previous excavations of middens, there was an underlying assumption of homogeneity built into the research design. Brennan's influential works have proposed that the "most reasonable view of a shell heap is that they are products of a single activity, the shucking of oysters" (Brennan 1977: 123). Other previous influential strategies are for example the California school of midden analysis, whereby rocks, bones, and other artifacts are classified as "disturbing factors" in the shell matrix (Cook and Treganza 1984: 289). These attitudes could handicap site research by setting up poorly supported hypotheses.

Recent studies have fortunately begun to question this perspective of the homogeneous midden. It is now generally recognized that many coastal sites serve very different functions within the regional settlement system, even though they have traditionally been lumped together (see Barber 1983). Shell middens and all sites are probably far more complex than originally thought. And if research was conducted accordingly, perhaps more evidence of architectural remains might be discovered.

THE MYTH THAT THE SITE ENDS AT THE SHELL MIDDEN'S EDGE

Shell midden sites may indeed provide some evidence within the confines of the shell itself of architectural remains. This currently has been the typical scenario under which postmolds have been located (see Tables 1 and 2, and Chapter III). However since most of the attention has been on shell midden excavation, this is not surprising. There may be another strategy of research. If the architectural evidence from the shell middens proper is incomplete or inconclusive then the solution may lie elsewhere. Perhaps the evidence lies either in different types of sites (for example inland) or even outside the edge of the shell midden.

As Hatchery West has demonstrated "those areas in which activities resulted in the loss or abandonment of the greatest number of items is not necessarily the same as the area where the greatest concentration of features occurred" (Binford 1972: 80). Shell middens are a concentration of shells, artifacts and features and consequently may not be the living areas of prehistoric peoples. This is not to say the shell midden was not ever lived on but rather this may have been a function of time, season and culture. Perhaps the habitation areas are located either adjacent or nearby to the shell midden. As Lightfoot discusses:

> "One possible explanation views these sites as being part of a contemporaneous settlement system, an interpretation that implies shell middens were not isolated entities, but rather a single component of a much larger spectrum of activities conducted by coastal groups" (Lightfoot et al. 1984: 35).

This interpretation of the shell midden representing only one component of a much larger settlement pattern is viable. Not only does this make relevant the area directly surrounding the midden but also the nearby hinterland. "There is considerable evidence that many prehistoric activities took place in the near and far hinterland of residential basis" (Lightfoot et al. 1987: 126). And as Sanger (1981: 40) mentions both the non-midden and midden components are crucial for understanding these types of sites.

The assumption that a shell midden is the dwelling locus of the peoples who deposited the shell may be incorrect. "That campers lived on or within the mass of shell they were accumulating is simply not credible" (Brennan 1977: 137). Shell middens are partially the result of shell harvesting, and it does not necessarily mean that it is living space. There is a possibility that the garbage heap and living space were distinct zones, each with specialized activity areas. "Further if a shell heap does not provide the space for contemporary camping on neither does the loose sharp-edged shell provide a tempting surface. To camp on a heap of fresh shell would be like camping on a dump of broken glass" (Brennan 1977: 123).

However, at the Riverton site in Illinois, clay platforms were found directly on the midden proper. It was hypothesized that these were either working platforms or house floors (Winters 1969: 98).

> "Apparently, housekeeping standards tended toward those approved today, at least in respect to the surface of the platform itself. However tidiness and sanitation seem to have stopped at the platforms edge, with refuse disposal being hauled with a minimum of effort. After all a few more aromas in what must have been an interesting melange of ripeing mussel shells, aging meat and decaying vegetable products, would have has little effect on the general atmosphere of the area" (Winters 1969: 100).

The relationship of debris and living in relatively close association may be dependent on cultural norms and season of use. Until such factors are tested for, the relevance to interpreting the activities of prehistoric populations in coastal New York is unknown.

If Brennan (1977) is correct, the shell midden is merely a dump of a highly biased sample of refuse. If the reconstruction of Byers and Johnson (1939) is correct, the midden is part of the actual living area. There is a third possibility that the shell midden may be one component in a much larger pattern of habitation and utilization of the landscape. Investigations geared accordingly, must be conducted at several sites representative of different time periods in order to ascertain which of the possibilities or a combination thereof is most accurate.

As Sanger discovered, residential bases, such as those in Maine, are composed of two adjacent components, a habitation area containing house structures situated along the back side of the site and a dumping area (Sanger 1981: 40). Such a model might have an application in coastal New York, and only through additional fieldwork, with this hypothesis incorporated in the research design, will the question be satisfied.

THE POSSIBILITY OF LOCATION AND IDENTIFICATION OF ARCHITECTURAL REMAINS

The task of identifying different site types compounded by the heterogeneous nature of the sites themselves could overshadow the research goal of discovery and identification of architectural remains. Such research endeavors will probably be frustrating and appear to be hardly worth the attempt. Negative data and/or long research projects are difficult to justify over fieldwork with immediately rewarding production potential. Architectural remains may have to be sought quite a distance in adjacent areas or distant hinterlands.

There is a great deal of frustration which often arises when a site which has a full array of features, food remains, and a whole range of artifacts, but does not contain any information regarding architectural features. This had lead to the outworn solution of explaining this absence by postulating "impermanent flimsy shelters" (see for example Ceci 1977 and Wyatt 1977). Such _a priori_ assumptions are inadequate and have partially been to blame for the paradigm "crisis" as presented by Ceci (1977, 1982) that "prehistoric habitation sites appear to represent the remains of small populations who visited the coast during the warm seasons for short periods" (Ceci 1977: 83).

Without adequate research strategy, undirected excavation can easily retrieve enormous quantities of redundant data, which may prove to be inadequate for resolving important issues. The task therefore is to minimize the acquisition of data while maximizing problem resolution. As Shawcross (1975: 46) has noted "[b]y now most archaeologists are aware that assemblages are compound samples, products of archaeological techniques and proportions of the sites that are excavated". It may take a lot of sifting of soil before architectural remains are located. The actual testing must be refined as the data is collected and analyzed.

Within the last decade (see for example Gwynne 1979, 1982, 1984) archaeologists have begun to recover architectural evidence. It is important to note that the local archaeological community is changing as more literature is being generated and the field itself becomes less pioneering, and starts to build up its data base (see for example Lightfoot et al. 1984; Lightfoot 1985, 1986, 1987; and Gwynne 1979, 1982, 1984). One of the products of the settlement/subsistence paradigm crisis as projected by Ceci (1977); has been better and more conclusive research, with architectural remains subsequently being discovered.

Many aspects of the present archaeological record are ambiguous, generally poor and "frustratingly incomplete" (Ceci 1982: 7). Throughout the history of Long Island archaeology, artifact procurement has been a primary research goal rather than systematic theory-building and testing. It is because of this attitude that there are gaps and paucity of information.

Methods and approaches can determine results as much as the data base itself. "Unfortunately, research designs and theoretical premises implicit in much of the shell midden research to date have been inadequate to recover and interpret much of the data contained in the sites" (Sanger 1981: 39-40).

CHAPTER V

THEORY BUILDING: TEST CASES AND EXAMPLES

A survey of the extant research and field data base has yielded five sites which might warrant testing for postmold remains. These "unrealized archaeological assets" will be examined for potential research avenues which could be explored. In most cases, the data collection did signal to the principal investigator that there were possibilities for additional productive exploration. Either a shift in strategy or simple fieldwork sampling techniques might have provided the much needed data. In the cases where such issues were not considered in the research strategy, any discovery would have provided some interesting and enlightening information regarding the remains of shelters or other architectural remains, or the lack thereof.

Alternative methods of inquiry are needed. The typical concentration upon the shell midden exclusively while ignoring the outlying non-midden area is simply to narrow and automatically skews any data recovered or judgment regarding site density and size derived therefrom. There is a paucity of archaeologically derived information on how Long Island hunter-gather bands spatially organized themselves across the landscape. This is particularly true in the case of sites which have as a component a shell heap or midden.

By varying the research designs and methodology in conjunction with changing predilections towards selecting obvious sites for excavation, the inclusion of less obvious site types, along with a clearer understanding of spatial relationships, would probably lead to more productive field strategies. This is not to readily conclude that if the following exercise were to be applied that evidence of architectural features would immediately and wonderfully appear. Rather, data would be available either in support or contradiction of their presence. Both are worthwhile contributions. The results of any intelligent field application of a well-founded hypothesis is always interesting and worthwhile.

In the search for architectural features, the best site candidates are probably residential base sites. This does not imply that short-term habitation sites, camps, or other brief living areas are definitely void of such remains. The assumption here is that by virtue of the residential semi-permanent to permanent nature of base camps, there is merely the increased probability of finding such features in quantity.

In addition to the exploration for postmolds, other forms of "structures" should be actively sought, including clay platforms and rock clusters. Both the midden area and the environs should be examined, the exact extent of the latter depending on the results of preliminary testing. The actual emphasis in field operations would depend on the artifact scatter and topography that surrounded the midden. Taken together, the midden plus the adjacent activity areas would provide a rather complex intra-site pattern. The midden would ultimately be seen simply as one component of a much larger set of spatial arrangements on the part of prehistoric populations. Currently, the midden itself still enjoys center-stage attention.

In Table 1, there appears to be a relationship between postmolds and features. However, these vary from burials and hearths to baking pits, in some cases storage pits (three for example). However that is not always true as evidenced by the Crystal Brook site (see Chapter III). Most field work has been in sites which are middens or burials, excepting Twin Ponds, an inland site (see Table 2). Superficially, it appears that sites with cooking/storage features may also be good possibilities for architectural evidence. This hypothesis however, has not been tested and may only be a product of field investigation bias.

Future field research particularly on sites which have features as identified in Table 1 might be productive in providing architectural remains. It is important to consider Binford's example at Hatchery West and consider "(t)hose areas in which activities resulted in the loss or abandonment of the greatest number of items is not necessarily the same as the area where the greatest construction of features occurred" (Binford 1972: 180). Investigation of areas with low artifact density might be prudent.

The following site examples will be examined in order to evaluate their potential for providing architectural data along with the strategies which could yield results. In all cases, except for Wading River, these approaches could still be employed. Wading River has subsequently been destroyed by large scale construction.

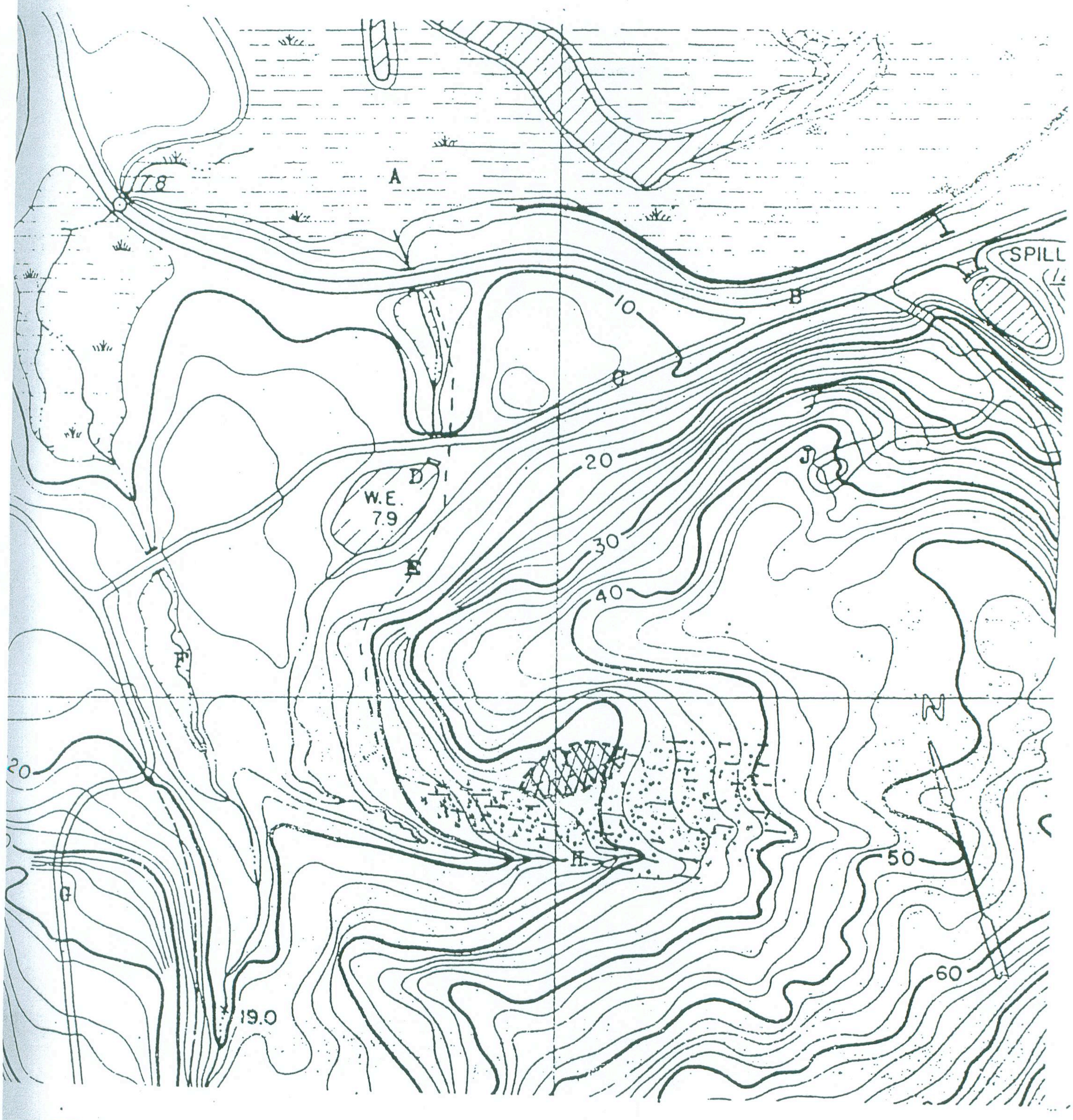
One site, Cedar Creek, is provided as a contrary example of the above hypothesis. Not all sites will or can be expected to provide such data. In the example used, a bulk procurement station, no postmolds would probably be located regardless of the diligence and effort. Other sites such as plant processing stations or lithic and ceramic workshops would probably be equally unproductive.

TICK HOLLOW

This site (Nassau County Museum #221) is located on the northern tip of Glen Cove in a large County-owned preserve, Welwyn. It is a shell midden site located just east of a small creek, Flag Brook. The midden is oval in plan view (see Figure 3), 75 feet long on the north-south axis by 160 feet on the east-west axis. Its shell deposit ranges from trace quantities near the periphery of the midden to a maximum thickness of 1.70 feet. The deepest deposit appears to be thickest in the central northern and western areas of the midden. There is a minor amount of lithic material present in the clayey loam subsoil.

During 1979, this site was investigated by Ronald J. Wyatt of the Nassau County Museum along with a small staff. The purpose of the excavation was to identify the nature and extent of the midden. This site was excavated as part of Nassau County's commitment to investigating Long Island's prehistory. Five 5 foot squares were excavated as a trench along the northern edge of the midden. In situ features included a rock feature and a storage pit. Postmolds were not found nor were any other investigations conducted outside the midden proper (Wyatt 1979).

Based on the limited excavation, this appears to be a year round



DETAIL FROM NASSAU DPW TOPO MAP, Bd. 6-I (1957)
SCALE: 1" = 200'

FIGURE 3: The Tick Hollow Midden (cross-hatched) in relationship to the surrounding areas (dash-dot) where artifacts have been recovered during shovel testing.

residential base. This is supported by not only the features but also the cultural remains which included projectile points (both Archaic and Woodland), flakes, worked quartz, bifaces, hammerstones, ceramics, firecracked rocks, bone awls, worked bone, and other occupational debris. The faunal remains included not only shellfish [predominate were quahog (Mercenaria mercenaria) and soft clam (Mya arenia)] but also deer, fox and turtle. In addition there were charred hickory nuts and other evidence of plant procurement and processing. Seasonality was linked to an unantlered skull of a male deer, which suggested a late winter-early spring deposit.

In 1980, Ottusch-Kianka and fieldcrew made numerous tests around the midden in the adjacent (within 100 feet) areas (see Figure 3). The results were the discovery of quartz worked chunks, flakes, firecracked rocks, ceramics, whole shells, bone fragments and a hammerstone. It is suspected that this adjacent area may have been part of the spatial configuration of this site. This non-shell midden zone may have either been a component of the internal structure of the site or a completely different functional activity area, but the artifacts recovered appear to link the area to the total internal site organization. The boundary of this site does not abruptly end with the shell midden's edge.

This site, once the non-midden remains are considered along with seasonality, place the relatively undisturbed portion of the site as a primary candidate for architectural feature testing. In this particular case testing should include a 150-200 foot radius surrounding the midden to the east and south. These areas are flat, while there is a marsh to the south-west which may have provided food and water depending on the state of the pond/marsh development at the time of occupation. Testing should not be limited to test holes, and formal excavation should be conducted quite extensively.

The diverse artifact base, the features and the cold of the fall - early winter season all hint in varying degrees at the possibility of finding architectural remains.

MOTTS POINT

In 1982 Lynn Ceci, then of Queens College, excavated a Woodland shell midden at the IBM Club in Port Washington. This was a field school excavation, where it was hoped to clarify the extent and nature of the deposit. While this site was extensively disturbed, eleven stone hearths and one deeply buried possible postmold were located (Ceci 1982b: 22). This was a case where all reported excavation was conducted within the midden boundaries. Since this site was previously excavated and in addition extensively modified, it might have been a beneficial course of research to examine the non-midden areas rather than concentrating on disturbed midden. Motts Point is a good example of a disturbed deposit that might have been made more interesting by employing a slightly different research strategy. This site appears to have some promise based on the features and the already discovered possible postmold.

OAKLAND LAKE

This site was excavated by the Metropolitan chapter of the New York State Archaeological Association as part of their goal to investigate local resources. This Woodland site offered a substantial array of artifacts and in situ features which lent support to a residential summer-fall occupation (for interpretation of seasonality see Kaeser 1974). If additional analysis were initiated, for example on the shellfish bivalves, this site may be reconsidered as a year-round occupation. It was even hoped by the excavators that this "uniquely sheltered" area would provide "evidence of settlement" (Kaeser 1974: 20). In spite of a careful search in the various midden strata and particularly in the underlying yellow subsoil into which large poles could be set for winter shelter construction, none were found (Kaeser 1974: 20). Kaeser then falls back on the possibility that the shelters were lightly framed warm weather houses and that they were built upon the shell directly. While this may be possible, an investigation of the non-midden area might have proved beneficial. At the very least it would have partially supported his hypothesis of the shelters if the results were negative.

Again, the diversity of artifacts and in situ features while not a guarantee are indicative of a good possibility that architectural features might be available for discovery.

LIVINGSTON POND

This Lloyd Harbor midden spreads over a quarter of an acre. There are numerous springs in the area and a steep gradient to the north provides some weather protection. On the east and west sides are marshes, and it is quite possible that during the prehistoric Woodland occupation there was a small creek with adjacent wetlands there.

Over a period of years, James E. Truex excavated 34 five foot squares, all either in or immediately next to the midden (Truex 1986). This was undertaken for purposes of site identification for Friends World College, the current owners. Twenty-one postmolds were found, usually near shallow hearths. However, the postmolds did not yield a discernible pattern and are thought to be the remains of drying racks (or some other domestic activity) rather than dwellings. Perhaps subsequent activities and their post-depositional impact have obscured the pattern, creating only what appears today to be a vague and random pattern. A second hypothesis is these may be the remains of lean-tos or some other non-permanent structures.

This midden site has a full inventory of artifacts, numerous in situ features including hearths, rock features and storage pits. The faunal remains included shellfish, deer bone (including antlers) and a variety of small mammals and amphibians.

Some excavation was undertaken adjacent to the midden, but postmolds were not located outside the midden. Test holes in the non-midden area has also not been productive (Truex 1986). However, this site may be an example of another possibility. Instead of shelters being located adjacent to the midden, they may have been at a distance.

There are two other sites in the immediate vicinity of Livingston

Pond, the Big Tree and the Boathouse sites, both within 100 feet to the south and east. In the area immediately to the east and west is a series of man-made ponds which may have been the result of damming a small creek during the European occupation. The ponds artificially divide these sites.

Both sites are primarily lithic scatters with a few examples of pottery. Perhaps, this would be a potentially rewarding area for testing for additional architectural features and supportive evidence. The lack of shellfish and a large quantity of debris may be indicative of a specialized area.

This site has many interesting aspects including the diversity of artifacts and the two non-midden artifact manifestations. At the very least, an investigation of the second area would permit intra-site organizational data. However, in order to locate architectural remains, the excavations must be extensive enough to provide the opportunity to find postmolds at this locale.

WADING RIVER AND SHOREHAM SITES

During the years of 1967-68, Ronald J. Wyatt of the Nassau County Museum excavated five prehistoric sites at the Wading River locality. This was undertaken as part of the Museum's commitment to studying Long Island's prehistoric past. Of these only two will be examined; the Wading River and Shoreham sites (see Figure 4 for location). A total of 42 squares were excavated prior to the wide-scale development of this area. It was hoped by the principal investigator that the occupation of

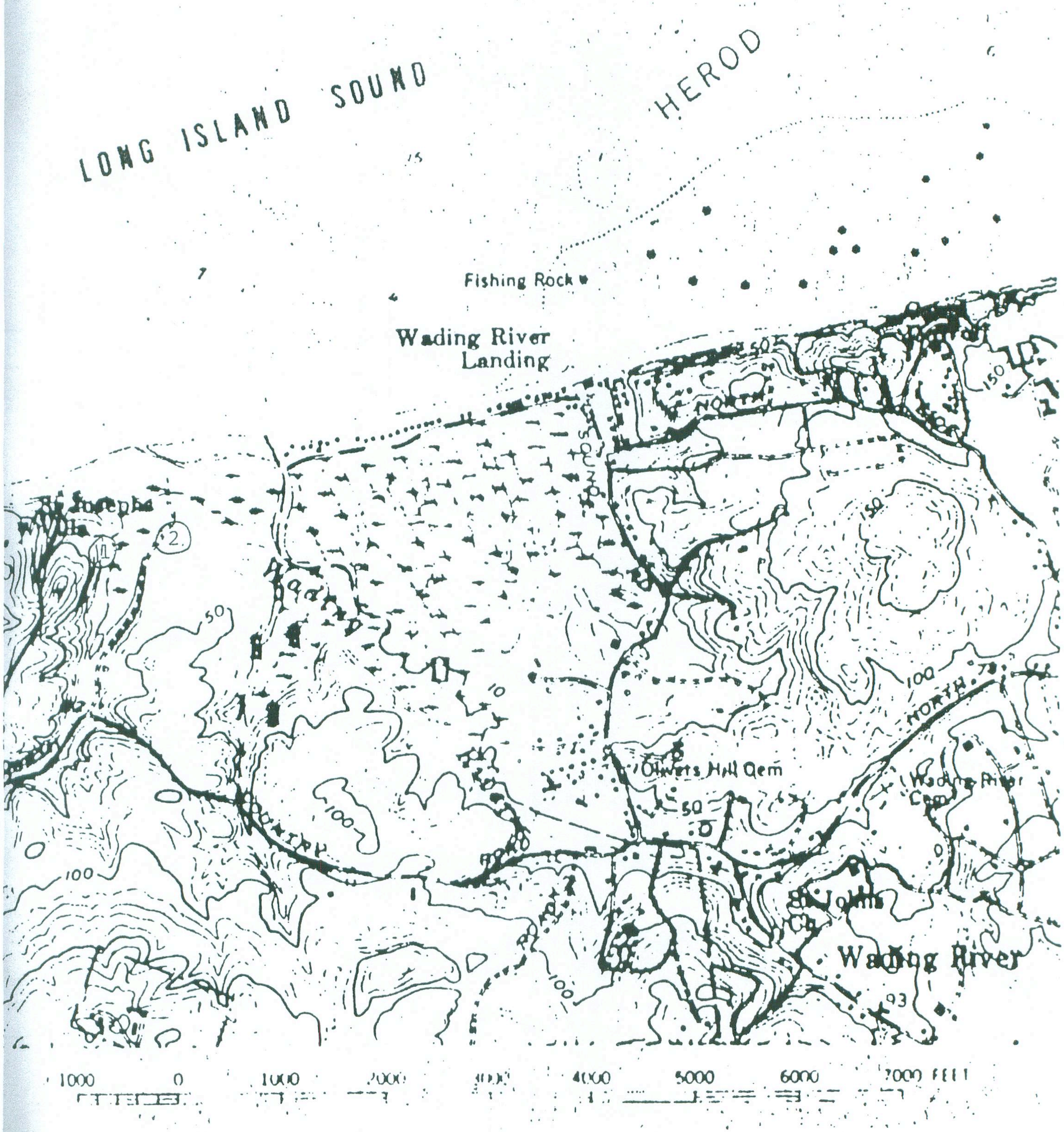


FIGURE 4: Location of the Wading River Sites: Topographic detail from U.S.G.S. Wading River, New York Quad. 7.5' (1957). 1. The Shoreham Site and 2. The Wading River Site.

the Wading River site would provide a better understanding of the Wading River point manifestation of Late Archaic times. There was also the hope that significant diagnostic cultural associations necessary for the definition of a regional phase would be located (Wyatt 1974: 11-12). The interrelationship of these sites was also considered a research priority.

Wading River and Shoreham were relatively shallow deposits adjacent to marshes and on the lee side of hills. Four distinct microenvironments; the bay, the marsh, the wooded uplands, and the shore, provide rich and varied food sources. In addition there was the availability of fresh water. Wyatt (1974: 27) has suggested that the soft shell clam beds were important as a food resource and this area was consequently abandoned as the shellfish habitat was destroyed by the transformation of the shallow bay into a salt marsh (Wyatt 1974: 27). The Archaic site at Shoreham is considered (Ceci 1977: 82) to represent a new cultural adaptation to the improving resources of a new coastal environment.

The Shoreham site was situated 1330 feet south of the Long Island Sound on a flat to gently sloping ground along the northern edge of Pleasant Hill. This site was approximately 365 feet long and narrowed progressively from a width of 180 feet (east-west axis) to a 30 foot wide strip. The northern portion was under a marsh with a surface elevation of about 7.7 feet above mean low water (Wyatt 1974: 1). There are numerous fresh water springs in the area.

Five 5 foot squares were laid out in an L-shaped pattern (see Figure 5) in an area where there was stratified shell layers. Apparent-

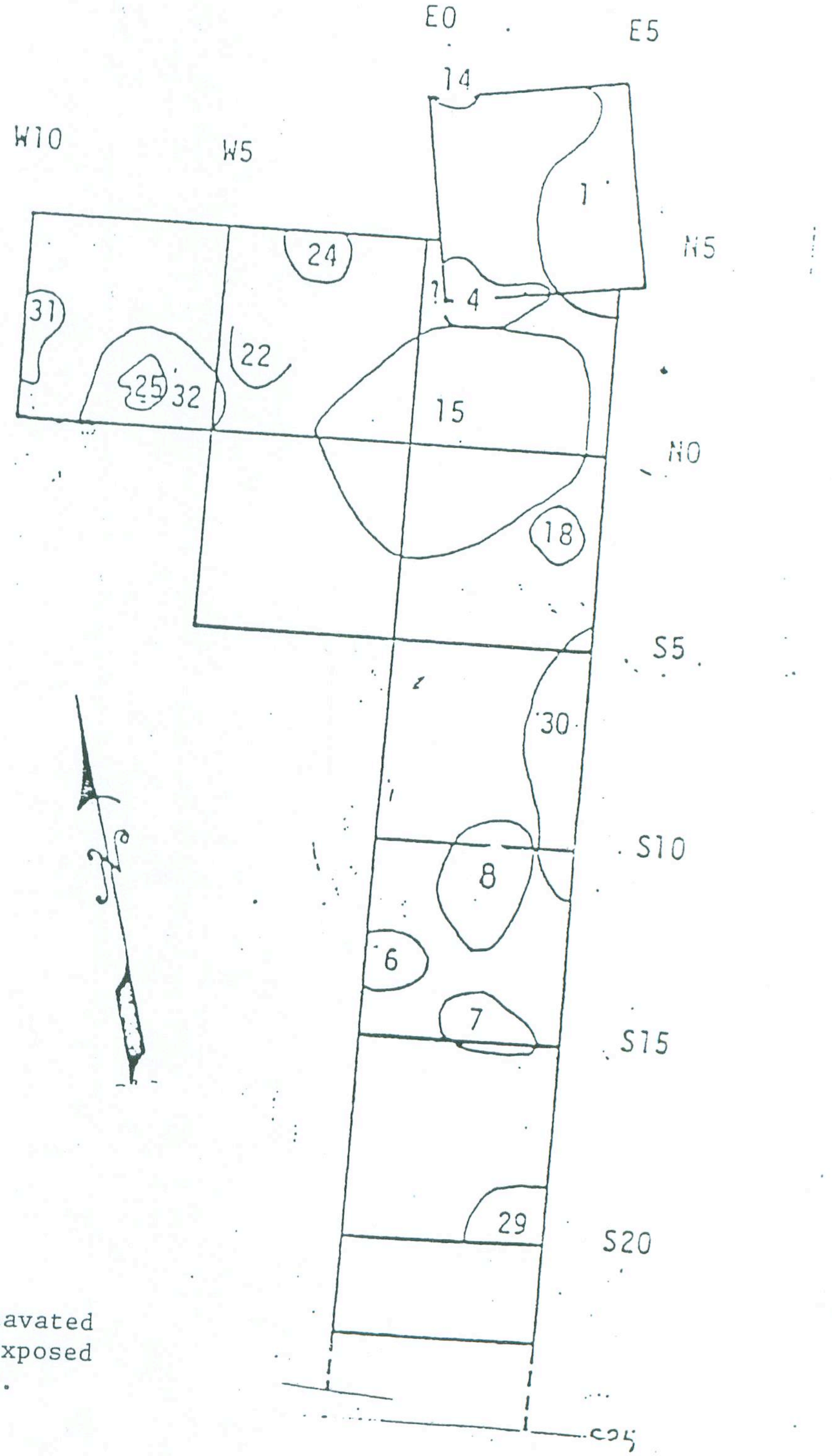


FIGURE 5: Shoreham Site: Excavated squares in relationship to exposed features. Drawn by Ronald J. Wyatt (Wyatt: 1967).

ly "only when the site underwent development was it learned that the deepest part of the shellfish midden lay north of the area excavated" (Wyatt 1974: 2). Although shellfish density does not necessarily suggest optimal data retrieval it might have been beneficial to ascertain this prior to excavation. Fifteen features were identified; eight food refuse, four rock features, two earth filled pits, and chipping debris. Six of the eight food refuse features were interpreted as shellfish baking pits.

The stratigraphy was a follows: Layer I was a brown loam with a mixture of historic and aboriginal artifacts. There was a scattering of shellfish remains. Cultural material included some bone, flakes, Archaic projectile points, scrapers, hammerstones, pottery, and antler flakers. Stratum II was the midden level with an increased concentration of shellfish and averaged .53 feet thickness in cross-section. This was the main occupational level. Cultural material included quartz chipping debris, animal bone (primarily deer and turtle), firecracked rocks, both Archaic and Woodland type projectile points, scrapers, drills, knives, netsinkers, hammerstones, bannerstones, antler and bone awls, and pottery. Similar to Layer I, there were features associated with this layer, seasonality was hinted at by the recovery of antler.

Layer III, the bottom most stratum, was a glacial sand. Shellfish fragments were sparse and diverse. This layer was excavated to an average depth of 1.10 feet. Cultural material included quartz flakes, food remains, stone and bone tools, and Archaic projectile points.

Shoreham appears to have had potential for locating postmolds, if indeed they had existed at this site. The diversity of artifacts suggests a residential site. However, the extent and depth of the deposit was not ascertained until the end of excavation, making it possible that this site was another example of excavation without a maximum data retrieval strategy implemented. No excavations were conducted outside the midden.

The Wading River site was the very same midden site excavated in 1955-56 by William Ritchie. It was again excavated during 1967-68 by Ronald J. Wyatt, of the Nassau County Museum. This site is located along the western edge of a salt marsh and is only 200 feet south of the Shoreham site and 350 feet north of another site (Cusano) (see Figure 4). To the east of this site was a creek.

When Ronald Wyatt excavated this 240 feet long and 175 feet wide (on the north-south axis) shell deposit he dug ten squares, two of which were outside the midden proper. The two outside squares sampled a submarsh deposit which extended at least 20 feet east of the midden. However, "[n]o attempt was made to determine the extant horizontal extent of the sub-marsh portion of the site" (Wyatt 1974: 1). In this section of the site, firecracked rocks and quartz flakes were abundant. In addition, food remains and domestic implements such as scrapers, knife-like bifaces and bone awls were sparsely distributed away from the midden (Wyatt 1977: 72).

In this non-midden area, zone OM, two stratified soil layers were identified. OM I, the uppermost stratum, was comprised of brown to dark brown sand and OM II comprised of yellow sand. Excavations ranged from a depth of 1.10 feet to 2.40 feet and aboriginal cultural material was abundant is both layers. Within layer I, quartz debitage, chunks of quartz, deer bone, pottery sherds, split pebbles, bifaces, and 27 points were found. Layer OM II yielded quartz flakes, worked quartz bifaces, firecracked rocks, shellfish fragments, sherds, projectile points, and fragments of hickory nut shells (Wyatt 1974: 9). This layer was predominantly Late Archaic based on both the artifacts and a Carbon 14 date of 3710±120 B.P. (1,760 B.C.) (GX2415).

In summary, four features were recovered outside the midden zone: two hearths, a rock concentration associated with an earth filled pit, and a refuse feature in OM II (Wyatt 1974: 18). A total of 15 features were found at the site including eight food refuse pits, three rock concentrations, two hearths, one biface cache, and a dog burial.

It appears from the description provided in Wyatt's report (Wyatt 1974) that this non-midden area may have been a part of the internal organization of this site, as a non-midden or outlying component.

> "In contrast to the squares outside the midden zone, there is ample documentation for the use of this portion of the site as a living area. The cultural deposit is fairly deep. The rich dark brown soil reflects the decomposition of substantial quantities of organic camp refuse. There is an abundance of food remains. Ample signs of food preparation activities are seen in the quantities of firecracked rock, and the shellfish baking feature. As indicated . . . the variety and quantity of tools and implements . . . is greater inside than outside of the midden zone. Especially noticeable in scrapers, thin bifaces and awl fragments" (Wyatt 1974: 50).

Wading River was identified as an Archaic residential base site (Wyatt 1974: 50). Again, no postmolds or other architectural evidence was identified. This may perhaps lie in the problem of methodology or excavation strategy.

While Wyatt did excavate outside the midden, his work was limited to 2 five foot squares (25 square feet of total gross area) and no work was undertaken to delineate the non-midden site boundaries. The features and artifacts discovered were only a small sample of this site's potential.

It is probably because the investigation of the site's internal structure and the identification of functionally differentiated activity areas were not part of the testing strategy that they were not given priority. However, it is also probably due to this limited testing that no evidence was recovered of architectural features. Wyatt's method by his own admission "often discouraged the excavation of whole features" (Wyatt 1974: 5). This may be a site which supports the notion that intra-site excavation bias may provide only some of the answers. In addition, the field data collection approach utilized may skew the results, providing only partial clues to an undeciphered, dead cultural system. The areas that could have received more attention include the submarsh deposit along with other surrounding non-midden zones.

On the basis of the paucity of architectural evidence, Wyatt (1974) suggested that this was probably part of a central based, wandering community pattern (see Meggers 1956: 138-40 for a description of this settlement pattern) with the shell midden as the major focus of the settlement or occupation (Wyatt 1974: 23). Wyatt did interpret this site as a fall-winter occupation (based on faunal and floral remains, see Wyatt 1974) and felt that shelters were probable. The hypothesis offered was that perhaps these were flimsy and impermanent, with no surviving evidence thereof.

The Wading River site, based on diversity of cultural materials, in situ features, and season of occupation is a good example of a site which might provide evidence of architectural remains if investigated with that research objective. It is proposed the non-midden area, with the light artifact scatter and some features, may have warranted a thorough excavation. As Binford has duly noted "[t]hose areas in which the greatest number of cultural items were lost or abandoned do not necessarily coincide with the areas where the construction of features most frequently occurred" (Binford 1972: 178). It would have been beneficial to explore intra-site patternings.

CEDAR CREEK

This site is probably a good example of a bulk procurement station and consequently does not offer a high probability of architectural evidence. The discussion of this site type is to provide a contrast to the examples already presented, being a good model for a highly specialized coastal shellfish processing station and probably an example of a homogeneous deposit dating from the Late Woodland period.

This Wantagh site is represented by three large shellfish north-south lying mounds of aboriginal origin. Prior to the deposition of 11-19 feet of hydraulic sand fill on the sites by Nassau County; only the highest points protruded through the surrounding marsh. The mounds ranged from 0.3 - 1.4 acres in size and it is suspected that they were reduced during the 19th Century, when mined by local farmers for their lime content.

These mounds were investigated during 1967-68 by Ronald J. Wyatt for the Nassau County Museum for purposes of ascertaining the nature and extent of the site, and were again examined in 1979 by Wyatt, Edward Johannemann, Ellen Kintz and Edward Rutsch, in response to the construction of a water reclamation building in this areas.

After a reasonable amount of testing, the results indicated that the middens were composed primarily of hard shell clams (*Mercenaria mercenaria*) which occasionally displayed some evidence of fire smudging. Present in smaller quantities were oyster (*Crassostrea virginica*) and whelk columellae (*Busycon* sp.). A few artifacts were found during the 1967-68 program including a few firecracked rocks, a small amount of quartz fragments (also found during the latter program) and two pieces of deer bone (Wyatt 1976, 1979b: 6). Otherwise virtually no artifacts were recovered from this site. Analysis of the shellfish by cross section suggested that the shellfish were harvested at this site all year round (Rutsch et al. 1985: 59).

The near absence of artifacts and daily living refuse does not support an interpretation for a residential site. But rather this was probably a highly specialized site, whose only purpose was to harvest meat from the shell packaging. The clams were probably harvested in the bay, carried to the processing station on the sand or mud flats, and some may have been baked on layers of hot coals (Wyatt 1976: 12).

The meats would have been extracted and dried, and transported upstream to local village sites. The Australian Anbara for example, prepare and process shellfish at designated sites, with the shells being discarded and the meats transported as far as three to five km inland. Wyatt proposed a corresponding inland habitation site, possibly in the vicinity of Merrick Road. Unfortunately, this very same area has been heavily developed for some years (Wyatt 1976: 13).

By virtue of the nature and purpose of this site evidence of architectural features would be unlikely, the site instead providing data for the role of bulk processing stations in the subsistence/settlement models. A research design tailored towards locating architectural remains would probably not be productive at such a site.

SUMMARY

Wyatt and others (see for example Kaeser 1974, 1963) have had to depend almost exclusively on artifact remains, seasonality data and other indirect evidence for supportive data in interpreting the settlement patterns of prehistoric populations. There are virtually no architectural features to support the existence of these proposed patterns. While there appears to be evidence of year round occupations, and permanent or semi-permanent habitation sites, there is very little documentation of shelters or other structures (sweat lodges, etc.); a result of the field data collection procedures that emphasized excavating high density artifact areas (concentrations of midden), inappropriate testing (testing at bulk processing stations, etc.), and the lack of identification of the internal spatial distribution of cultural remains within the larger site area.

It would be better to target the semi-permanent to permanent residential bases which offer evidence of daily living debris. Architectural remains may be either within the midden itself, immediately adjacent to the obvious midden, or at even some distance. It is possible that the shelters were modest, impermanent, or even completely lacking. However, most cultures, and according to the historical accounts, so does coastal New York (see for example Danckaerts 1959, Jameson 1967), do have some sort of housing or shelters. It may even be more improbable not to have shelters on Long Island given the fall/winter/early spring weather conditions.

Regardless of the results of any well organized and thought out search, the informational product would be significant in considering the questions of intra-site spatial organization along with local and regional subsistence/settlement models.

CHAPTER VI

CONCLUSIONS

The location and identification of architectural remains on coastal New York may require a different research strategy than (1) that previously applied and/or (2) those models applied to other geographical areas. This is not an entirely new approach and has been partially addressed by others:

> "The data suggest that we need to rethink our present models of culture history and culture change. In the Northeast, culture has often been preconceived as a series of complete or almost complete replacements, each culture with its own pottery and point types.... The data from the Fastaner and other sites indicate, however that in southern New England and coastal New York, at least, the traditional...is no longer viable" (Lavin and Salwen 1983: 41).

In this instance, the primary issues were theories of culture change and artifact typology as applied to coastal New York by analogy from other geographical areas, but should probably be extended to consider the issues of shelter and intra-site organization. It has been relatively recently that settlement patterns have been re-examined (see Lightfoot et al., 1987 and Lightfoot, 1985) and subsequently reinterpreted. It is very possible, that coastal New York may not fit the models or theories which were generated from different geographical areas.

This however is not to say that Long Island or coastal New York is not comparable to other geographic regions or to the surrounding area. Surely, there are similarities, but there are also differences. The probability of regular trade and periodic population movements between interior and coast would have fostered some similarities. But a coastal adaptation is a different strategy and would foster a particular set of lifeways.

Instead of tailoring the data to meet the model, pattern or topology, it would perhaps be better to allow the data, without bias, to follow through to a conclusion. For example (as discussed in Chapter II) interior habitation sites should be examined for shelters with and without possible hearths in association. Since postmolds on Long Island have been found both with (see Gramly and Gwynne 1979, and Harrington 1924) and without (Gwynne 1984) hearths. Those found without hearths had only a lithic scatter in association.

The type of remains found and other evidence of material culture may be different through time and may be unique to Long Island. Long Island by nature, including size, diversity of flora and fauna, geological history and environmental factors, is fairly unique island for the Northeast. Until proven otherwise, it might be beneficial to consider the data base as full of all sorts of possibilities. Research designs and hypothesis testing should be tailored with these such factors considered. It is only after we develop a sound data base that the information can be used comparatively with other geographical areas in a productive and worthwhile fashion.

SEASONALITY AND SHELTERS

One of the important variables in considering possible habitation areas (where shelters would have been built) is the seasonality of a site. The establishment of a permanent residential base or a semi-permanent occupation is dependent upon the resources available (Jochim 1976: 51, Ceci 1977: 89). Until recently, shell middens were assumed to be summer sites (for support of the warm weather theory see Ceci 1984). Lightfoot's analysis of the shell at Sungic Pond has supported rather a all year pattern of utilization (Lightfoot, et al. 1987: 115); only the late winter/early spring was not well represented.

It was partly due to this assumption that researchers have begun to look for the winter "component" elsewhere, perhaps in inland sites. Another theory presented was that Long Island sites were the remains of highly mobile groups from other geographical areas who visited the island during the warm seasons for a brief period of time (Ceci 1977: 83).

The issue of seasonality and shellfish harvesting may be relevant to problems of locating the remains of architectural features. Recent research has demonstrated that shellfish harvesting varied greatly from locale to locale.

> "It appears that the native use of shellfish was seasonal, beginning sometime in the fall or winter and concluding during the late winter or spring. The historical observations summarized in Loftsfield (1976) however, state that shellfish were gathered from April until July. Such a late collection period is clearly at odds with the result of this project. Several writers from the first two centuries after contact echo this schedule so observer error is apparently not the

> cause for this discrepancy between the archaeological and historical record" (Claassen 1986: 217).

Shellfish remains from the DeWeese Mound (Archaic) in Kentucky shows that shellfish harvesting occurred sometime during the months of February to December (Claassen 1983: 24). The samples from 19 Woodland sites in Onslow County, North Carolina reveal an aboriginal collecting pattern of winter-spring (Claassen 1986: 221). In the Gulf Coast shellfish were gathered from spring-fall as were Atlantic marine shellfish. In addition, the shellfish analysis done on the one site at Shelter Island, Long Island (see Lightfoot, et al. 1987: 115) also supports summer-winter harvesting; contrary to the hypothesis that shellfish harvesting was a warm weather activity (Ceci 1977, 1982). An assumption partly based on the ethnographic record and also the aversion of modern people to cold water and temperatures.

The summer collecting pattern may have been a modification by the aboriginal populations in order to capitalize on the European trading visits. The European warm weather trading parties attracted native populations and created summertime coastal camps. This change in "scheduling would account for the recorded summertime shellfish activity of the Indian populations" (Claassen 1986: 217-218).

This model can be substantiated by historical accounts for Long Island:

> "They had no houses, but slept under the blue heavens, some on mats of bulrushes interwoven, and some on the leaves of trees" (Hudson, quoted by DeLaet in Jameson 1967: 48).

> "Some of them lead a wandering life in the open air

> with no settled habitations; lying stretched upon the ground on mats made of bulrushes, they both take their sleep and food especially in summer, when they go nearer to the sea for the sake of fishing" (DeLaet in Jameson 1967: 57).

Contact almost always will lead to widespread cultural changes for both parties. Therefore, the use of ethnographic analogy cannot always be used to determine prior behaviors.

The assumption that shell middens were warm weather sites had an impact on how middens and architectural remains were considered together. This is an example of how a theory with no support except "logic" and ethnographic analogy limited investigations into possible relationships.

STRATEGY

To increase the probability of finding architectural remains, other sites besides the shell midden (both midden and non-midden areas) should be considered. Inland sites may provide a component in the settlement pattern. A case in point is Twin Ponds in Middle Island, where postmolds were discovered only after one season of fieldwork.

Inland sites have been consistently under-emphasized at the expense of the highly visible coastal shell middens. Yet, when the total range of prehistoric sites are considered, shell middens may be in the relative minority as a site type. At Shelter Island, Mashomack Preserve, "of the 18 prehistoric sites located, only five can be defined as shell middens" (Lightfoot 1986: 26). This emphasis on shell middens has biased the literature and skewed the interpretation of the prehistoric record.

The excavation methodology strategies previously employed also have a direct bearing on what is or isn't discovered, and there may be greater productivity if more excavations were conducted outside the midden. In addition, a larger scale approach may be better than excavation of small scattered units or a single trench. This would be particularly desirable if a site was facing large scale destruction. Postmolds did appear after large sections of midden were removed at Bull Calf Landing and Strongs Neck (see Chapter III). Surveys are also inherently biased towards the recording of sites characterized by large artifact scatters (Nance 1979: 173-74), biasing the sample towards the locating of the larger sites. The smaller sites characterized by a light density of artifact scatter may be just as desirable for testing. Unfortunately these often are more difficult to identify.

There is a tendency to excavate the deepest shall deposits although such areas provide little information (Sanger 1981: 48). Again the other sites which comprise the remainder of the dispersed elements of the settlement pattern (non-midden areas or inland sites) might be productive. As Sanger (1981: 40) acknowledges it is necessary to study both the non-midden and midden components to completely understand a site.

The diversity within a midden should also be investigated. For example Sanger (1981) in his work in Maine had identified a pattern of clustered dwellings and hearths in areas of low shell deposits near the landward side. But the same pattern was not indicated at the Wheeler's site (Barber, 1982) in Massachusetts. Long Island has virtually been untested and the internal structure of some of the shell middens is unknown. "It is discouraging to realize that much of recent shell midden archaeology, including my own is deficient in so many ways" (Sanger 1981: 40).

Shell middens may develop or grow by a checkerboard pattern (Byers and Johnson 1940: 197) with habitation and dumping areas shifting over time. An area used for dumping at one period might be later used for habitation, and still again later for dumping. All this would ultimately form a three-dimensional checkerboard pattern. This model of midden development might have an application in coastal New York.

The detection of such diversity within a midden might be exposed by excavating a large area rather than small randomly placed squares (see for example Livingston Pond, Chapter III), thus exposing the shades or gradients of the internal complexity. "One of the most disturbing conclusions is that our traditional sampling techniques are suspect. Traditional strata cuts and randomly placed test pits will not, in all probability, give us a true picture of the cultural events represented by the shell midden sites" (Sanger 1981: 40).

It was not until recently that shell middens were perceived as other than a monolithic class with very little variation. However "in truth, both archaeological and ethnohistoric data indicate that shell refuse accumulated at a wide variety of sites, [has] a great diversity of function, season of occupation, permanence, and so forth" (Barber 1982: 10). Therefore not all shell middens sites will have postmolds for the archaeologist to find. Site specialization is an important variable. However, if a wide range of activities is indicated then daily living debris could point to the site's being a residential base. Or if a prolonged occupation is suspected with a degree of artifact diversity and there are features, then probably there is a good chance of finding some evidence of shelters.

POST DEPOSITIONAL ISSUES

Among the most active destroyers of the archaeological record are the occupants of a site. This is exemplified by the use of old shell middens by aboriginals for building purposes (Sanger 1981: 40). Site occupants may have also dug into older strata to construct storage and roasting pits, as well as other features. The longer a site was occupied, the greater the possibilities for artifacts and features being lost, destroyed or discarded. Site abandonment and reoccupation can seriously damage the stratigraphic integrity of a previously deposited stratum.

In Table I, all known Long Island sites with postmolds were inventoried along with the associated features. One pattern which did emerge is the association of postmolds with burials. These may have been grave houses. "Flannery does not list grave houses as a Coastal Algonquian trait, which may mean that they were not general in that area, but grave houses of some sort are recorded for a Massachusetts group as early as 1620" (Voegelin 1944: 345). However, the occupational debris may indicate that these structures functioned as dwellings at least prior to the burial. Among Southeastern groups, some buried their dead under the floor of a dwelling (Voegelin 1944: 354). Usually after this type of burial, the dwelling was abandoned. These graves may also have been an already existing storage pit or perhaps some other utility pit. Frozen ground may also have been a problem leading to the avenue of disposal.

The vacating of the shelter could account in part for the preservation of postmolds and other features. It has also been well documented (Barber 1983, 1982 and Sanger 1981) that the occupants themselves destroy features and artifacts during their day to day activities; but quick departure after burial could partially be responsible for the intact archaeological record.

In addition to the variables discussed above, other considerations include, chemical changes, expansion of postmolds by rodents and other burrowing creatures into nests and tunnels, and disturbance from roots. To compound nature's impact, modern man's activities of farming, construction, pot hunting and poor archaeological techniques can all destroy the delicate postmold.

SUMMARY

The search for architectural remains has been a research concern for only a few (Gwynne 1984 and Lightfoot 1986). The majority of the archaeological community have not given serious consideration to the possibility of finding dwellings outside the midden. Brennan offered one aspect:

> "Nor does it seem likely that, with all the open space available, would a wickiup or other shelter be set up adjacent to the heap which would be an obstruction that has to be walked or worked around. Juxtaposition of heap and living area would, of course, have made it easy for the campers to dispose of their waste on the shell heap they were also depositing" (Brennan 1977: 123).

Brennan also commented that to live on a heap of loose sharp shell would be similar to camping on broken glass (Brennan 1977: 123). This perspective however may have included a few of his own cultural biases regarding comfort and housekeeping.

As Wading River demonstrates, cultural remains can be located adjacent to a midden or outside of a midden. Perhaps investigating areas of light artifact scatters, adjacent midden areas, or inland sites we might recover evidence of architectural remains. As Binford (1972: 180) noted "sites with high densities may result in the peripheral area having a greater density of cultural features." Taking a lesson from Hatchery West these may be very productive sources of research. However, if all else fails and postmolds are not located in any meaningful quantity, then perhaps this in and of itself will provide clues as to the behavior of prehistoric peoples. It would also provide some new data on coastal New York's homestead patterns.

If such a program of research was successful, the data would provide some powerful information on the size and shape of shelters, construction techniques, perhaps the type of wood used, and most importantly contribute to the settlement theories for coastal New York prior to contact. In order for this to occur, archaeologists must immediately begin to make the search for postmolds or other architectural evidence a part of their research designs for all archaeological projects.

> "Although a great deal more evidence must be added to these seven small stains before the Late Archaic subsistence and settlement system on Long Island is well understood, the fact that this kind of indirect evidence still exists in Long Island's sandy soil will, I hope, encourage area archaeologists to be vigilant in their search for evidence of coastal settlement patterns" (Gwynne 1984: 7).

If the current attitudes, models, assumptions and poor excavation techniques continue, the possibility of discovery and identification of architectural remains, and in particular postmolds, will be hindered at almost every turn.

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